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PRINCIPAL INVESTIGATOR: Marie B. Caulfield, Ph.D.

CONTRACTING ORGANIZATION: VA Boston Healthcare System
Boston, Massachusetts 02130

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Marie B. Caulfield, Ph.D.

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

VA Boston Healthcare System
Boston, Massachusetts 02130

E-Mail:

mbcaulfiel@aol.com

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Rates of premature first-term attrition approach 50% among women Marines. We propose that adjustment to first term enlistment among women and men in the US Marine Corps (USMC) will be associated with distal factors (i.e., psychiatric histories, exposure to childhood stressors), proximal factors (i.e., task and socioemotional characteristics of the military setting) and their interaction. This prospective, longitudinal study assessed USMC recruits throughout the initial 19 months of their first-term enlistment.

Participants reported disturbingly high rates of premilitary trauma, with women reporting significantly more trauma than men. Attrition was significantly higher in both male and female recruits reporting a history of interpersonal trauma. Poorer preparation for recruit training as measured by participation in Delayed Entry Program, pool meetings, and perceived preparedness was associated with increased attrition. Lower self-efficacy and higher levels of anxiety and depression during the first week of recruit training also were associated with increased attrition. The relation of childhood trauma to emotional reaction to the acute stress of recruit training appears to be mediated by internal resources (self-esteem, hardiness, problem solving ability).

This investigation informs policy makers and clinicians concerned with improving retention in the USMC and optimizing both women's and men's performance and adaptation.

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Table of Contents

Cover.....	1
SF 298.....	2
Table of Contents.....	3
Introduction.....	4
Body.....	4-10
Key Research Accomplishments.....	10
Reportable Outcomes.....	11-12
Conclusions.....	12-13
Exhibit 1: Statement of Work.....	14
Table 1: Summary of Participants.....	15
Table 2: Recruit Training Attrition.....	15
Tables 3-4: AFQT Scores and Attrition.....	16
References.....	17
Appendices.....	18
Appendix A: Annotated Briefing presented to USMC Command, August 2000	
Appendix B: Symposium presentation at Association for Advancement of	
Behavior Therapy, November 1999	
Appendix C: Paper presented at American Psychology Association, August 1999	
Appendix D: Manuscript submitted for publication	

Introduction

Rates of premature first-term attrition approach 50% among women Marines¹ compared to rates of 29-35%² for males. This project was designed to develop a model of how past life experiences are associated with the adjustment of female and male enlistees in the US Marine Corps (USMC), specifically, their successful adaptation and completion of the first-term of enlistment. The foundation of this project was based on variants of the *diathesis-stress model* that postulates that individuals enter settings (i.e., military service) with a wide range of behavioral, psychosocial, and familial characteristics. These characteristics, which may differ for women and men, constitute both strengths and vulnerabilities (diatheses), each of whose expression or effect is strongly influenced by the experiential context. Current data suggest that active duty personnel enter military service with a range of strengths and vulnerabilities (e.g., psychiatric and trauma histories³). We proposed that adjustment to first term enlistment among women and men in the USMC would be associated with distal factors (i.e., psychiatric histories, exposure to childhood stressors), proximal factors (i.e., task and socioemotional characteristics of the military setting) and their interaction. Further, gender differences in adjustment would be partially accounted for by gender differences in rates of exposure to certain distal and proximal events. In this study, we systematically examined how both pre-military and military experiences culminated in differing levels of well-being and performance-based accomplishments (e.g., retention, promotion, skill advancement) for female and male enlistees during the first term of service. This prospective, longitudinal study assessed female and male USMC recruits throughout the initial 19 months of their first-term enlistment. Distal factors and baseline mental and physical well-being were measured at the recruit depot. Proximal factors, occupational outcomes, and mental and physical well-being were assessed at the end of basic training, and at 9 and 19 months. This investigation will inform policy makers and clinicians concerned with improving retention in the USMC and optimizing both women's and men's performance and adaptation.

Status/Results to Date

Tasks 1-2

In accordance with the statement of work included in our initial proposal (see Exhibit 1), months 1-5 of the first fiscal year (10/1/96-2/30/97) were dedicated to the hiring and training of research staff and to the development and validation of our Time 1 (administered at the beginning of recruit training), Time 2 (administered just prior to graduation), and Time 2B (administered via mail to individuals who attrited during recruit training)

surveys. Surveys were finalized and the South Carolina site was set up during months 4-7 (1/97-4/97).

Our Time 1 survey is a 31-page document (including title page and consent form) that was designed to obtain the following information: (1) demographics and personal history including educational background, and work, relationship and marital history; (2) personal resources/personality traits including self-esteem, problem solving style, hardiness, interpersonal instrumentality, and social support; (3) trauma history including exposure to childhood physical and sexual abuse and neglect, parental conflict, and community violence as well as adult exposure to sexual and physical assault; (4) psychological and substance use history; (5) current emotional well being including the assessment of symptoms of depression, anxiety and post-traumatic stress disorder; and (6) current physical well being and functioning. Additional questions designed to assess military-specific factors such as participant reasons for joining the USMC, perceived severity of training-specific stressors, perceived self-efficacy for successful completion of recruit training and perceived unit-cohesion were also included. These questions were constructed by our research team in consultation with numerous Marine Corps personnel on Parris Island and at Headquarters, USMC in Washington, DC.

Our Time 2 survey is a 28-page document that, like the Time 1 survey, used well-validated measures to assess (1) personal resources and personality traits; (2) current emotional well being; and (3) current physical well being. Additional well-validated measures designed to assess the perceived socioemotional characteristics of the training environment such as racial discrimination, sexual harassment, access to social support within the training unit, and interpersonal conflict were also included. Finally, in addition to the military specific questions included in Time 1, we also added several questions about the perceived usefulness of the Marine Corps' core values training classes and the Crucible experience on personal behavior and commitment to the Marine Corps, the occurrence of hazing during training, and participant satisfaction with recruit training and the participant's personal performance. These latter questions were prompted by our desire to provide the USMC with empirically sound feedback regarding many of their recent training innovations. Their construction was facilitated by the close and collaborative relationship we established with the Marine Corps once our research personnel were installed on Parris Island.

Our Time 2B survey is a 29-page document that is virtually identical to the Time 2 survey except that several questions designed to assess adjustment to the civilian environment were added.

The piloting and refinement of these surveys was a multi-step process. Time 1, 2, and 2B surveys were first evaluated by two highly regarded experts in the fields of gender, life stress, health and performance outcomes. After modifying the surveys based on their feedback, we administered all the

Time 1, Time 2 and 2B surveys to small groups of male and female recruits on Parris Island. We then conducted a series of confidential focus groups in which their feedback regarding the ease of administration and content relevance of the surveys was obtained. The surveys were revised according to this feedback and then re-administered to new groups of female and male recruits who also participated in focus groups. After a third round of revisions, the surveys were distributed to a number of Marines on Parris Island, including commissioned and noncommissioned officers, for final feedback.

Task 3

The final version of our Time 1 survey was administered to a total of 826 female and 1021 male recruits on-site at Parris Island from 5/19-9/30/97 (months 8-12 of the grant). Data collection was greatly facilitated by the fact that all survey administration sessions (both Time 1 and Time 2) were included in the formalized training schedules of all platoons slated to take part in our study. The Time 1 survey was always administered on Forming Day 5 of recruit training, i.e., the Monday before Training Day.

The final version of our Time 2 survey was administered to the same subjects at the completion of their training. We began in 8/97 and completed administration of the survey in 12/97. The Time 2 survey was always administered two days before graduation (Training Day 62). While the majority of recruits graduate with their original platoon and company, a large number change platoons at least once during training. This "recycling" occurs whenever a recruit is not fit to advance in training for any one of a variety of reasons including injury, inability to master academic material, or failure to meet physical fitness requirements. The phenomenon of recycling and the complications it posed to our data collection was addressed by stamping recruit record books with a seal that identified them as part of our study and asked that our personnel be contacted whenever a recruit was dropped from the platoon. We also had access to the recruit training depot's tracking system, PI ARMS.

Task 4

The Time 3 and Time 4 surveys were developed and finalized from 10/97 - 12/98 (months 13-27 of the grant). The Time 3 survey originally was slated to be administered 3 months after recruit training graduation (months 14-18). The administration of this survey was pushed back to 9 months after the completion of recruit training (months 20-24) due to the lack of feasibility of locating Marine participants so soon after graduation. In the first few months after recruit training, the Marines are moved frequently from one training site to another, and as a result, it was not possible to obtain reliable mailing addresses for a substantial number of our participants during that time period. Further consultation with Marine Corps command staff

indicated that this change in chronology would have little impact on the conceptual basis of our third survey point.

The Time 3 survey is an 18-page document that includes many of the same instruments as the Time 2 survey to measure current emotional well being, current physical well being, characteristics of the training environment, and access to social support within the training unit. In addition, questions about family responsibilities were added to the Time 3 survey. The Time 3B survey is similar to the Time 2B survey except that it excludes questions asking about the training environment, since that information was collected previously.

The Time 4 survey is a 16-page document that includes many of the same instruments as the Time 3 survey to measure current emotional well being, current physical well being, characteristics of the training environment, and access to social support within the training unit. In addition, questions about family responsibilities and deployment were added to the Time 4 survey. The Time 4B survey is similar to the Time 3B survey. Time 3, 3B, 4, and 4B surveys were designed based on the original Time 1 and 2 surveys. USMC officials were consulted about additions to these surveys. All surveys are consistent with the substantive issues and questions proposed in the original grant.

Task 5

Any study participant who attrited during recruit training was interviewed by our on-site study personnel prior to discharge. The interview we created is semi-structured and is designed to gather information regarding the recruit's personal experience of recruit training, his/her reasons for leaving, and future plans. It also seeks to solicit continued participation in the study and current mailing addresses are obtained. The interview was partially based on existing Marine Corps exit interviews and includes a brief essay question that asks the recruit to describe in his/her own words his/her reasons for leaving training. As with survey administration, all interviews were conducted by highly trained Ph.D. and Masters level mental health professionals.

In addition, all attritees were administered follow-up surveys via mail during 8/97 - 12/97 (months 11-15). Compensation of \$20 was provided to attritees for completion of each follow up survey. The first wave of Time 2B surveys was sent out in 8/97 to participants who had begun training in 5/97. Our return rate for these surveys after the first mailing was somewhat low (approximately 40%). Phone follow-up was done to verify or obtain correct addresses for non-respondents. A second mailing was then done, yielding a total response rate of approximately 60%.

Task 6

The first mailing of Time 3 and 3B surveys was sent out between 2/98 and 5/98 (months 17-20). Reminder postcards were sent out two weeks after the mailing. If no response was received after one month, a second survey was mailed. Phone follow-up was done for non-respondent 3B participants to verify or obtain correct address information. Compensation of \$20 was provided to attritees for completion of the 3B survey. The response rate for Time 3 surveys was about 35% for those remaining in the USMC, and about 53% for the 3B respondents (i.e., attritees). One reason for the relatively low response rate for Time 3 surveys was considerable difficulty locating many participants. Approximately 13% of Time 3 surveys were returned by the U.S. Post Office as undeliverable, and we were unable to obtain correct addresses for these participants from the USMC. This survey was sent out at a time when many participants were changing duty positions and/or stations, and it is possible that even more than 13% of the participants never received the survey. In contrast, only 6% of 3B surveys were returned as undeliverable, and our total response rate for this group was comparable to the response rate at Time 2B. The lack of compensation associated with the Time 3 surveys may also have contributed to the low response rate. Due to difficulty locating participants, data collection took longer than expected and was completed in 10/98 (month 25).

Task 7

Initial descriptive analysis of correlates of recruit-related attrition was prepared and presented to USMC command personnel at Quantico in May 1998 and May 1999. Results were presented to USMC command personnel at Parris Island Marine Corps Recruit Depot (MCRD) in April 1998. A copy of the most recent of these presentations is shown in Appendix 1.

A summary of the demographics of the Time 1 participants is shown in Table 1. The attrition rates for participants while on Parris Island are shown in Table 2. Early analysis of the attrition data shows some differences between attritees and graduates, and these patterns may vary by gender. For example, male attritees receive significantly lower scores on the AFQT General, the AFQT Elect, AFQT Clerical and the AFQT Mechanical subtests (Table 3). In contrast, female attritees scored significantly lower on the AFQT Clerical, but not on the other AFQT tests (Table 4).

Task 8

The first mailing of Time 4 and 4B surveys was sent out between 1/99 and 3/99 (months 28-30). This mailing was pushed back subsequent to the delay of the Time 3 survey that preceded it. Reminder postcards were sent out two weeks after the mailing. If no response was received after one month, a second survey was mailed. To improve response rates, we offered \$20 compensation to both Time 4 and 4B participants who returned

completed surveys. In addition, we worked intensively with Marine Corps Headquarters to obtain updated addresses and phone numbers for Time 4 participants. As a result, we were able to locate more than 98% of Time 4 participants. This rate is also likely to be positively impacted by lower rates of relocation by Marine subjects at that point in the first-term enlistment. We also used Choicepoint, a private search firm, to find addresses for 4B participants who we were unable to reach with our initial mailing. Despite this, we were unable to obtain correct addresses for 9.6% of 4B participants. Overall, we had higher response rates at Time 4 for the Marine participants, with a response rate for Time 4 surveys of about 51%. The response rate for attritees was somewhat lower, at 48% for the 4B respondents, due in part to increased difficulty tracking these individuals after they leave the USMC. Due to the extensive tracking procedure used to find participants, data collection for Time 4 was not completed until 8/99 (month 35).

Task 9

As discussed above, Time 3 and Time 4 data collections were delayed due to the practical constraints of locating our participants, discussed above. As a result, it was not possible to both complete a Time 5 data collection and process the data within the time constraints of the grant, even with the 6-month extension on the original grant, which extended it to September 2000.

Task 10

Because the surveys were created using a scannable format, data entry proceeded rapidly. Data entry for Time 1, Time 2, Time 3, and Time 4 is complete. Military performance data for our subjects from the Parris Island MCRD has been integrated into our database.

Task 11

Data analysis is largely completed. The data from Time 1 and Time 2 has been analyzed, and we are currently preparing several manuscripts based on that data. We have analyzed much of the Time 4 data, and have completed longitudinal data analysis on key constructs (using Times 1, 2 and 4) within the month. There are also manuscripts in preparation describing the results of the longitudinal data analysis. In performing data analysis, we have consulted with the USMC and the Center for Naval Analyses regarding interpretation of variables and results.

Task 12

To date, we have presented preliminary results to USMC command personnel at Quantico and Parris Island MCRD. In August 2000, we presented a final briefing at Quantico to USMC personnel in the Manpower, Training and Education, and Recruiting divisions. In addition, we have

presented Time 1 and Time 2 data at scientific conferences in poster, paper and symposium forms (see Reportable Outcomes).

Currently, we are actively working on three manuscripts based on Time 1 and 2 data. The first manuscript looks at the relationship between childhood factors and performance in the military. The second examines whether resiliency factors predict attrition, and the third analyzes the role of unit cohesion in predicting military performance. A fourth paper looking at the psychological impact of military workplace factors is also outlined, and will incorporate Time 3 and 4 data.

Key Research Accomplishments

- Our findings show that USMC enlistees report disturbingly high rates of pre-military trauma, with many rates twice those observed in the general population. Women enlistees report significantly more trauma than men.
 - Approximately 47.5% of male recruits and 68.1% of female recruits reported a pre-military history of at least one type of interpersonal trauma.
 - These findings are consistent with data on personnel in other military branches. For example, Rosen & Martin (1996)³ found that as many as 58% of female and 35% of male Army personnel reported experiences of child abuse.
- Preparation for recruit training as measured by length of time in Delayed Entry Program, number of pool meetings, and perceived preparedness (confidence) appears to impact attrition from recruit training.
 - Shorter length of participation in DEP and lower self-efficacy predicted attrition for male participants.
 - Attendance at fewer pool meetings and lower self-efficacy predicted attrition for females.
- Recruits who eventually attrited from recruit training reported higher levels of anxiety and depression during the first week of recruit training.
- Recruits who eventually attrited from recruit training reported higher levels of interpersonal trauma.
 - Female recruits with a history of interpersonal trauma were 1.6 times more likely to attrit during recruit training than were female recruits without a trauma history.
 - Attrition rates after recruit training were significantly higher for both male and female recruits with a history of interpersonal trauma compared to recruits without a trauma history.
- The relation of childhood trauma to emotional reaction to the acute stress of recruit training appears to be mediated by internal resources (self-esteem, hardiness, problem solving ability).

Reportable Outcomes

Wolfe, J., Turner, K., Caulfield, M., Newton, T., Melia, K., Martin, J., Goldstein, J. Gender and trauma as predictors of military attrition: A study of Marine Corps recruits. Manuscript submitted for publication.

Caulfield, M., & Turner, K. (2000, August). Adaptation to First Term Enlistment in the US Marine Corps. Final Briefing presented to Command and staff of USMC Manpower, Training & Development, and Recruiting Command, Quantico, VA.

Turner, K., Dixon, A., Caulfield, M., & Wolfe, J. (1999, November). Witnessing community violence: Implications for adaptation in young adults. In K. Turner (Chair), Chronic exposure to community violence in adolescents and young adults. Paper to be presented at the 33rd Meeting of the Association for the Advancement of Behavior Therapy, Toronto, Canada.

Dixon, A., Turner, K., & M. Caulfield (1999, November). Overall childhood abuse and adult sexual victimization: Results from a female military sample. Poster to be presented at the 33rd Meeting of the Association for the Advancement of Behavior Therapy, Toronto, Canada.

Turner, K., Dixon, A., & Caulfield, M. (1999 August). Training, preparation, self-efficacy and emotional well-being: Impact on Marine Corps attrition. In Impact of military service on emotional and psychological well-being. Paper presented at the Annual Meeting of the American Psychological Association, Boston, MA.

Wolfe, J., Turner, K., Caulfield, M., & Dixon, A. (1999, May). Adaptation to First Term Enlistment in the US Marine Corps. Briefing presented to Command and staff of USMC Recruiting Command, Quantico, VA.

Melia, K., Caulfield, M., Wolfe, J., Newton, T., Roper, S., Martin, J. & Goldstein, J. (1998, November). Impact of trauma history and socioemotional characteristics of the military setting on adaptation to the Marine Corps. Poster presented at the 32nd Meeting of the Association for the Advancement of Behavior Therapy, Washington, DC.

Melia, K., Caulfield, M., Folsom, S. & Wolfe, J. (1998, October). Adaptation to First Term Enlistment in the US Marine Corps. Briefing presented to Command and staff of USMC Education and Development Command, Quantico, VA.

Melia, K., Caulfield, M., Folsom, S. & Wolfe, J. (1998, May). Adaptation to First Term Enlistment in the US Marine Corps. Briefing presented to Command and staff of USMC Recruit Training Command, MCRD, Parris Island.

Melia, K., Caulfield, M. B., Wolfe, J., Newton, T., Roper, S. Martin, J. Goldstein, J. (1997, November). Impact of trauma history and socioemotional characteristics of the military setting on adaptation to the Marine Corps. Paper presented at the 13th Annual Meeting of the International Society for Traumatic Stress Studies. Montreal, Quebec, Canada.

Conclusions

Our study results show a number of major findings with implications for military policy. First, we found that our participants reported high levels of pre-military trauma. This confirms similar findings in other military populations, and extends it to a USMC sample. Secondly, we found higher rates of pre-military trauma in female participants than in male participants. This has been previously shown in civilian samples, but it is important to verify the finding in a military sample, as this study does.

A third major finding of the study is that childhood factors do appear to impact attrition significantly both during recruit training and following recruit training. This finding has important implications for recruiting subjects and for the training command. A fourth major finding is that participants' preparedness by the USMC was related to attrition. This is of vital significance for the recruiting command in designing preparedness programs and enrolling potential recruits in those programs. A fifth major finding was that lower levels of self-efficacy predict attrition during boot camp. This has direct implications for military training policy and practices, as it may be possible to reduce attrition by designing strategies to bolster self-efficacy in recruits when they come to recruit training. A sixth major finding was that minority recruits positively endorsed questions asking about racial discrimination in the USMC at rates significantly higher than white recruits, and that these rates of endorsement went up substantially at Time 4, as compared to Time 2. A seventh major finding was that gender discrimination and sexual harassment were not reported to be a problem during recruit training, but positive endorsements of gender discrimination and sexual harassment were high as reported by female Marines at Time 4. This difference may be reflective of the difference in environment for female Marines during recruit training, where all training is gender-segregated, and after graduation from recruit training, when they are working in gender-integrated settings. The racial discrimination and sexual harassment

findings indicate that the USMC needs to continue to pay attention to issues of discrimination and harassment after recruit training.

Scientifically, the effects of critical background experiences in young adults have been postulated, but not well documented. We found that personal resources mediate the impact of traumatic backgrounds on adaptation and extreme stress. Thus, our findings are an important contribution to the literature on stress, adaptation and trauma, in particular, the ability to respond to past trauma in a current, stressful setting. This study represents a unique opportunity to study the impact of extreme stress on individuals who enter the stressful setting (i.e., military recruit training) with significant trauma histories.

To extend this research to examine adaptation and attrition across the initial enlistment period, military personnel will need to be studied over longer periods of time.

Exhibit 1: STATEMENT OF WORK

Task 1	Months 1-5	Military consultation and collaboration; completion of survey design; collection of pilot data; survey refinement; hire and train project staff
Task 2	Months 4-6	Finalize printing of surveys for Time 1 and 2; set up South Carolina site
Task 3	Months 7-15	Collect data at Parris Island (Time 1 and Time 2); military consultation
Task 4	Months 11-12	Finalize printing of follow-up questionnaires for Time 3, 4, and 5
Task 5	Months 13-17	First mailing of Time 2 questionnaire to attritees; verification of addresses via Equifax for non-respondents; mail second questionnaire; phone follow-up for non-respondents
Task 6	Months 12-19	Update addresses of participants; first mailing of Time 3 questionnaire; verification of addresses via Equifax for non-respondents; second mailing of questionnaires; phone follow-up for non-respondents.
Task 7	Months 16-22	Initial descriptive analysis of correlates of recruit-related attrition; military consultation; preparation of initial research reports
Task 8	Months 18-26	Update addresses of participants; first mailing of Time 4 questionnaire; verification of addresses via Equifax for non-respondents; second mailing of questionnaires; phone follow-up for non-respondents.
Task 9	Months 24-32	Update addresses of participants; first mailing of Time 5 questionnaire; verification of addresses via Equifax for non-respondents; second mailing of questionnaires; phone follow-up for non-respondents
Task 10	Months 9-36	Ongoing data entry using scannable forms; entry of military performance data
Task 11	Months 17-40	Data analysis, including descriptive, inferential, longitudinal, and survival analyses; military consultation
Time 12	Months 25-42	Report-writing; dissemination of findings; manuscript preparation

Table 1
Summary of Participants

	Male (n=1021)	Female (n=826)
Race (percent)		
Caucasian, non-Hispanic	66.2	56.2
African American	22.6	18.1
Hispanic	7.9	20.5
Other	3.2	5.2
Age at entry (percent)		
17	9.7	13.7
18	50.8	50.6
19	21.2	16.8
20+	18.3	18.9

Unpublished data: do not quote without permission.

Table 2
Recruit Training Attrition (percent)

	Male	Female
Active duty	12.0	17.2
Reserves	16.0	17.9
90 Day Reserves	14.9	25.0
Overall attrition	12.6	18.1

Unpublished data: do not quote without permission.

Table 3
AFQT Scores and Attrition in Male Recruits

AFQT tests (150=maximum for all)	Attrited during recruit training	Graduated from recruit training
AFQT General Score*	103.7	107.2
AFQT Elect Score*	102.9	106.8
AFQT Clerical Score*	104.8	107.1
AFQT Mechanical Score*	100.7	104.2

*Significantly different between attritees and graduates at $p < .05$.
 Unpublished data: do not quote without permission.

Table 4
AFQT Scores and Attrition in Female Recruits

AFQT tests (150=maximum for all)	Attrited during recruit training	Graduated from recruit training
AFQT General Score	101.3	102.4
AFQT Elect Score	100.7	102.6
AFQT Clerical Score*	108.9	111.7
AFQT Mechanical Score	92.9	93.4

*Significantly different between attritees and graduates at $p < .05$.
 Unpublished data: do not quote without permission.

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2. Jareb AM. *Marine Corps Entry-Level-Training Attrition*. Alexandria, VA: Center for Naval Analyses; 1996. CRM-96-54. 40p.
3. Rosen LN, Martin, L. The measurement of childhood trauma among male and female soldiers in the U.S. Army. *Unpublished manuscript*.

APPENDICES

Appendix A

Adaptation to First Term Enlistment in the US Marine Corps

VA Boston Healthcare System/Harvard University

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This annotated briefing is a product of the Boston VA/Harvard University
Adaptation to First Term Enlistment in the US Marine Corps Study.

Presented by Marie B. Caulfield, Ph.D., Principal Investigator and Kiban Turner,
Ph.D., Project Coordinator. For further information please contact Dr. Caulfield
at mbcaulfiel@aol.com.

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- Marine Corps Recruit Depot, ERR, PISC
- Headquarters Marine Corps, Washington, DC
- Center for Naval Analyses, Alexandria, VA

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Rationale for Study

- Rates of first-term, non-EAS attrition of Marines are high, particularly for female Marines
- Previous research had focused primarily on demographic variables and physical fitness
- Current research is based on a model that considers the relation of pre-military and military experiences to adaptation

Rates of non-end-of-active service (non-EAS) first-term attrition in the U. S. Marine Corps approach 30% in males and 50% in females. This high level of attrition has resulted in considerable costs to the Department of Defense, the USMC and the individuals involved, and has motivated numerous research studies aimed at identifying salient predictors of attrition.

Studies of attrition have focused primarily on demographic factors such as age at entry, ethnicity and marital status, but the contribution of such factors has proved relatively weak. Recent studies conducted by the Center for Naval Analyses suggest that an individual's physical fitness at the beginning of recruit training (based on IST scores) may be a stronger predictor of entry-level attrition (Jareb & Suess, 1996).

The present study is based on a more comprehensive model that takes into account the recruits' personal history and current experiences, as well as interactions between the two, to explain adaptation and attrition. We call this a proximal/distal model.

Proximal/Distal Model

- Pre-military risk and resiliency factors, e.g., school history, involvement in sports and other group activities, trauma history, drug use, psychological history, etc.
- Factors in the military environment, e.g., mental and physical challenges, unit cohesion, quality of life

The goal of this longitudinal study is to identify factors associated with premature attrition and adaptation to the Marine Corps. It is based on a model that hypothesizes that premature attrition and adaptation are influenced by a constellation of *distal factors* (e.g., an individual's school history, psychological history, etc.), *proximal factors* (e.g., specific characteristics of the military setting such as mental and physical demand and unit cohesion) and the *interactions* between pre-military and current factors.

Study Design and Current Status

Prospective Study - surveyed Marines through first 19 months of enlistment

- Time 1 (Forming Day 5): May 1997 - Aug 1997
- Time 2 (Training Day 62): Aug 1997 - Dec 1997
- Time 3 (9 months): Feb 1998 - June 1998
- Time 4 (19 months): Jan 1999 - July 1999

The present study followed participating Marines through their first 19 months of enlistment. All participants in this study began recruit training at the Marine Corps Recruit Depot, PISC, between May 1997 and August 1997. During this time, all females entering Parris Island, as well as all males in the first 2 platoons of companies having female ship weeks, were asked to participate.

Participants were enrolled in the study at the beginning of recruit training by completing their first survey (Time 1 survey) on forming day five, i.e., the Monday before training day 1. This first survey asked about demographics and personal history as well as current emotional well-being.

Participants completed the Time 2 survey on training day 62, i.e., two days before graduation. This survey focused on recruits' reactions and adaptation to recruit training experiences as well as current emotional well being. Attritees were mailed surveys with many of the same topics included, as well as more information about their discharge and their plans regarding work and school following discharge.

The third and fourth surveys were administered via mail at 9 and 19 months post-enlistment. These surveys assessed individuals' adaptation and integration into the Marine Corps lifestyle as well as current emotional well-being.

In addition, all participants who attrited during recruit training were asked to participate in face to face interviews with study personnel before leaving Parris Island in order to assess reasons for and reactions to discharge.

Summary of Previous Briefings

Factors strongly associated with attrition:

- Preparation and perceived level of preparedness
- Initial emotional adaptation to recruit training

Factors weakly associated with attrition:

- Intellectual functioning factors

Factors not associated with attrition:

- Pre-military social adjustment

The finding we presented at earlier briefings showed that level of preparedness was an important predictor in determining who completes recruit training. Males who eventually graduated were in DEP significantly longer than those who attrited. Females who graduated attended on average almost twice as many pool meetings as those who attrited. At Time 1 (Forming Day 5), both male and female recruits who eventually would graduate reported feeling more prepared than did the recruits who would eventually attrit. Those who would graduate also reported higher confidence about their ability to complete recruit training and to meet the physical and mental challenges of recruit training.

The other strong predictor of attrition during recruit training was emotional adaptation during the first week. At Forming Day 5, those recruits who would eventually complete recruit training were, on average, less depressed and less anxious than those who would attrit. In addition, those who would attrit were more likely to experience characteristics of recruit training life (e.g., lack of privacy, too many rules, physical demands, mental demands, lack of contact with home) as more stressful than those who would graduate.

We will follow up on these findings on emotional adjustment today.

Findings Addressed In This Briefing

- Pre-military trauma and attrition
- Reasons for joining the USMC and attrition
- Recruit training experiences
- Satisfaction with training and with the USMC
- Discrimination & harassment at PI and in the fleet

Description of Participants

	Male N=832	Female N=698
Race (percent)		
Caucasian	66.6	57.8
African American	22.7	17.8
Hispanic	7.8	20.1
Other	2.9	4.3
Age at enlistment (percent)		
17	9.1	14.0
18	52.0	52.0
19	21.2	16.5
20+	17.7	17.5

The participant pool for the present data includes only active duty Marines.

The racial distribution is different for female participants, with a higher percentage of Hispanic participants. This difference is reflective of the fact that all female Marine enlistees train at Parris Island, including those from the western part of the U.S., which has a higher proportion of Hispanics overall. In contrast, the male participants are taken primarily from the eastern half of the U.S.

The race figures shown above add up to 100%. Some individuals endorsed more than one category (i.e. African-American and Hispanic). Anyone endorsing Hispanic was put in that category regardless of other racial endorsements. Individuals endorsing other multiple categories for race were included in "Other".

Description of Respondents at Time 4

	Male	Female
Original sample size	832	698
Still in USMC at T4	664	505
Completed survey	293	300
Response rate	44.1%	59.4%

This chart shows the breakdown of participants who responded to our Time 4 survey, and shows that we had a higher response rate from female participants. We also had a lower response rate from African-American women compared to women from other racial groups. There were no differences in racial composition for males between responders and non-responders. There was no significant difference in age or trauma history between participants who responded at Time 4 compared to those who did not respond.

Attrition of our sample

	Male N=832	Female N=698
During recruit training	11.9%	17.6%
After recruit training	8.3%	9.5%
Total attrition	20.2%	27.7%

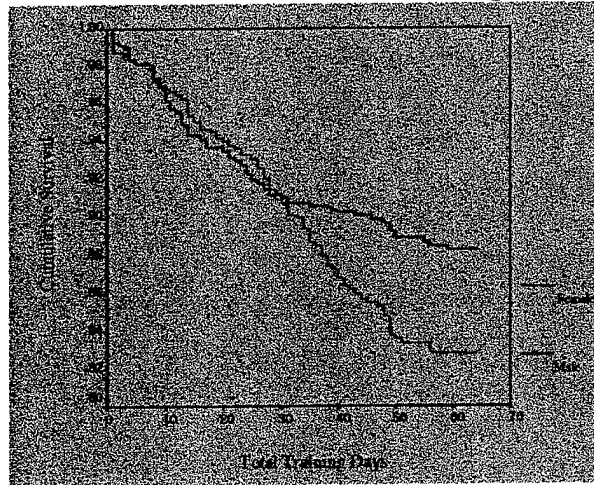
This shows the attrition rate for our sample during the time of data collection. Note that attrition rates for males and females in this study are lower than those reported for USMC recruits during fiscal years 95-97 when annual attrition rates were approximately 13.5% for males and 24.5% for females.

The lower rates of attrition in the present study may reflect seasonal variation in attrition as recruits enrolled in this study all entered training during the months of May-August 1997. Previous analyses have suggested that recruit training attrition rates may be lower during the summer months and higher during winter and early spring.

The attrition after recruit training is up to approximately Month 19 of their enlistment. Because this is a non-uniform amount of time to be considering, we do not have USMC comparison data.

It should be noted that this report includes attrition from all causes, including medical discharges. It is difficult to conduct analyses based on type of discharge given the inconsistencies in separation coding over time (GAO, 2000). We did run analyses excluding individuals separated for medical reasons however, and did not find significant differences in the results reported below.

Survival Curve for Attrition During Recruit Training



This graph shows the results of a survival analysis examining attrition patterns during recruit training. Survival analysis enables us to examine factors associated with the length of time an individual stayed in the military before attriting, and to create survival functions to show how long individuals with different characteristics can be expected to remain in the USMC.

This figure shows the survival plot of attrition by gender for our sample. Looking at a given point in time, the plot shows that the probability of a male participant staying more than 50 days is 89%, while the probability for a female participant staying that long is only 82%.

Our analysis showed that recruits who attrited did so between training day 0 and day 58, with a median of training day 23. Attrition patterns for men and women were similar until around training day 32, when male attrition leveled off and female attrition continued. Male recruits who attrited had a median number of training days completed of 15, compared to female attritees who completed a median of 26 training days. The log rank test showed that the survival patterns over time for men and women were significantly different ($p < .003$). Female recruits were 1.647 times more likely to attrit than male recruits (95% CI for the hazard or risk ratio = 1.239 to 2.189).

This pattern is consistent with USMC data from earlier cohorts, showing that most male attrition from recruit training happens early, while female attrition is more evenly spaced out over the training days.

Attrition and Trauma

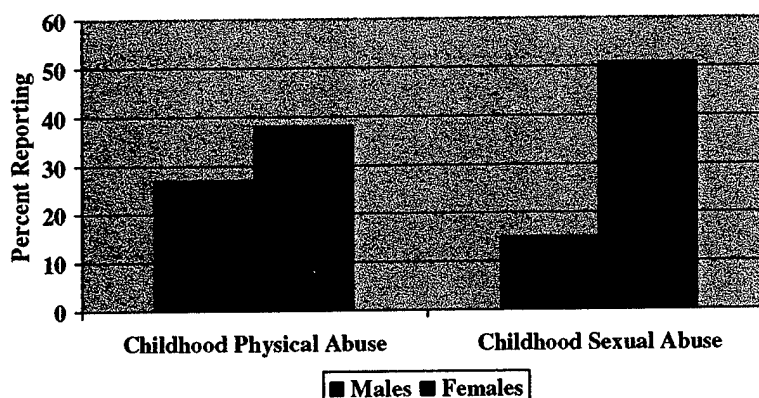
- Anecdotal reports and recent data suggest high rates of trauma in enlisted samples
- A wide range of adaptation problems have been related to trauma in military, veteran and civilian samples.
- We were interested in the role of trauma in adaptation to the military and, in particular, to the stress of recruit training.

Large-scale studies of Army and Navy recruits have found rates of childhood physical abuse ranging from 27% to 36% for men, and from 25% to 40% for women (Milner, Thomsen, & Merrill, 1998; Rosen & Martin, 1996; Briere, 1998; Merrill, et al., 1999). Similarly, these and other studies have found prevalence rates of childhood sexual abuse in military recruits ranging from 10% to 18% for men, and 26% to 53% for women (Stander & Merrill, 1999; Merrill, et al., 1998; White & Merrill, 1998; Briere, 1998; Gold & Merrill, 1998; Rosen & Martin, 1996; Merrill, et al., 1999).

In addition to child abuse, many military enlistees report histories of other types of interpersonal trauma. A recent study of active duty U.S. Army soldiers found that 31.2% reported having been attacked by someone with a weapon, and 23.6% reported having been attacked without a weapon, but with intent to injure (Stretch, Durand, & Knudson, 1998). A study of female Navy recruits found that 13.7% reported a history of physical assault at age 18 or older (Briere, 1998).

Two recent studies found a relationship between premilitary trauma exposure and attrition. A study of U.S. Air Force enlisted personnel found a positive relationship between childhood sexual abuse and attrition during basic training, with a 10.5% attrition rate for recruits reporting a history of abuse compared to 4.1% for recruits not reporting an abuse history (Smikle, Fiedler, & Sorem, 1996). Similarly, in a study of 5498 Naval recruits, Stander and Merrill (1999) found higher rates of attrition during basic training for enlistees with pre-military histories of sexual abuse, physical abuse and rape.

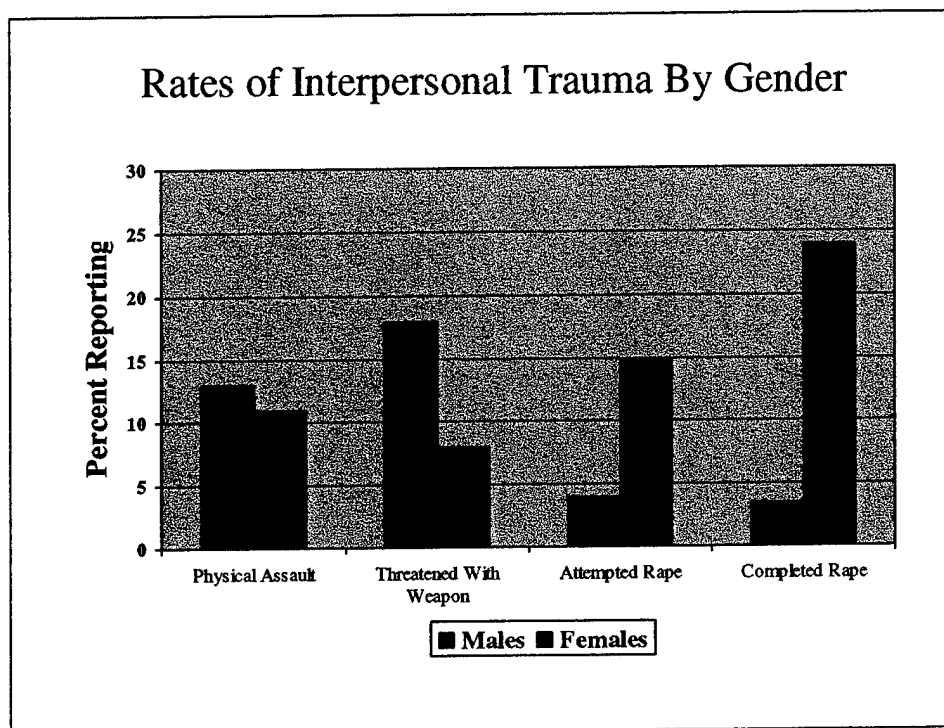
Rates of Child Abuse Shown By Gender



The first step was to document the extent of prior trauma exposure in our participants. At Time 1, all participants completed multiple measures that evaluated in different ways any exposure to physical or sexual abuse, as well as other violence (gender differences on both items significant at $p < .001$).

This graph shows the percent of male and female recruits who reported histories of childhood physical abuse or sexual abuse. These rates are alarmingly high. The prevalence of childhood physical abuse in a national comparison sample (Kessler et al., 1995) was 3.2% in men and 4.8% in women, compared to rates of 26.7% and 38.3% for men and women respectively in our study. Reported rates of childhood sexual abuse in the general population have ranged from 2.8-16.0% for men and 12.3-27.0% for women compared to rates of 14.7% for men and 51.0% for women in our study. Thus, the rate of child sexual abuse in our male participants is consistent with those in the general population, but the rate in our female participants is substantially higher.

Although these trauma rates are high relative to the general population, they are comparable to those found in other studies of military personnel.



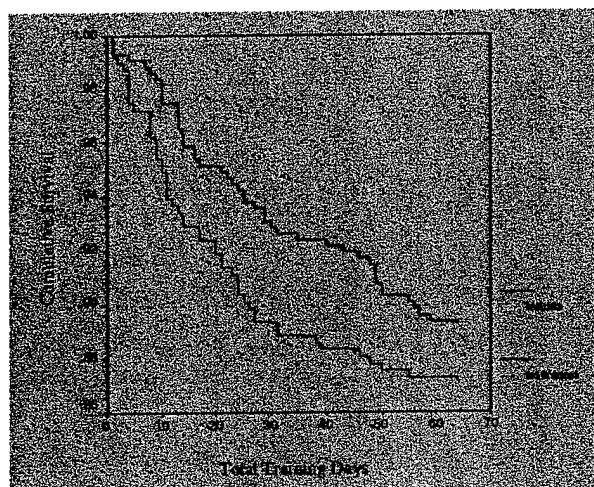
This graph shows the percent of male and female recruits who reported a history of pre-military victimization other than child abuse, such as lifetime physical assault, and attempted and completed rape since age 18.

Consistent with other studies (Kessler et al., 1995), significantly more females than males reported histories of attempted and completed rape ($p < .001$). There were no significant gender differences for physical assault, but men were more likely to report being threatened with a weapon ($p < .001$). Studies of female military recruits have found a rape prevalence rate between 18% to 36%, consistent with our findings (Merrill, et al., 1998).

A history of at least one type of interpersonal trauma was reported by 47.5% of male recruits and 68.1% of female recruits. While both rates are substantial, the rate for women was significantly higher ($\chi^2 = 65.095$; $p < .0001$).

Survival Curve

Male recruits with and without trauma

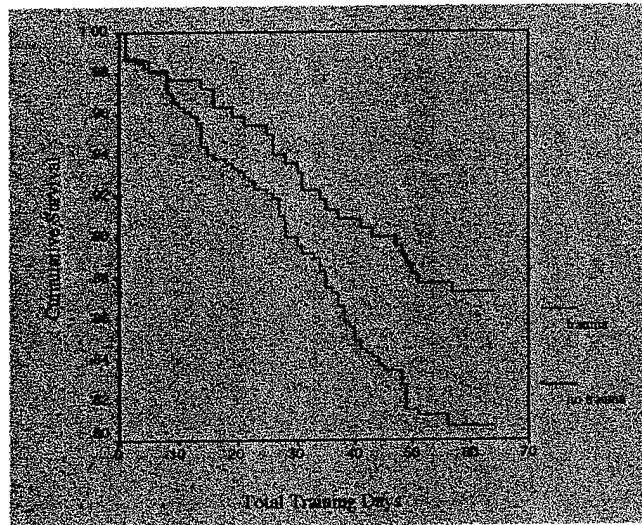


This graph and the one on the following page show the survival pattern for attrition from recruit training for those who had or had not experienced at least one of the interpersonal traumas summarized above.

The survival plot for males with and without interpersonal trauma showed lower retention rates for participants with a history of trauma. The log-rank test showed no statistically significant difference between the retention patterns for the male participants with and without premilitary interpersonal trauma ($p > .310$).

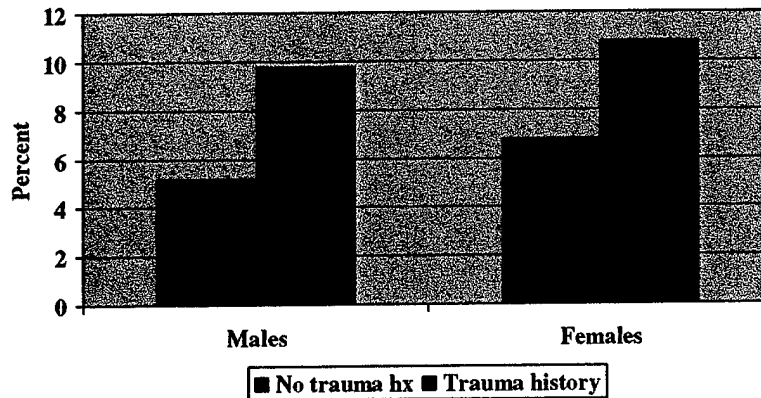
Survival Curve

Female recruits with and without trauma



The survival plots for females with and without interpersonal trauma also showed lower retention rates for participants with a history of trauma. The log-rank test showed a difference in retention patterns for the female participants with and without a trauma history. Females with a history of interpersonal trauma were 1.58 times more likely to attrit during recruit training than those with no such history (95% CI for the hazard or risk ratio = 1.034 to 2.413, $p < .032$).

Attrition Rates After Recruit Training (up to Month 19)



The graph shows the attrition rates for those who graduated from recruit training but attrited prior to Month 19. After recruit training, female Marines were not more likely to attrite than male Marines, $\chi^2=1.592$, $p>.20$. Those who had experienced premilitary interpersonal trauma had a much higher likelihood of attriting, with a 5.7% attrition rate in those without a trauma history and a 10.3% in those with a trauma history, $\chi^2=11.237$, $p<.001$.

Trauma survivors in the military

- There are high numbers of trauma survivors among enlistees across the services
- Survivors joining the military to escape problems has been proposed as one possible reason for these alarming rates

“How much did difficulties in your life influence your decision to join?”

- Asked about problems that may have influenced the decision to enlist:
Money, Housing, Family problems, Relationships outside the family, Violence, and Legal issues.
- For participants with no history of trauma, 45% of males and 47% of females said that at least one of these issues influenced their joining to some extent
- For those with a history of trauma, 65% of males and 70% of females reported that these problems influenced their joining to some extent.

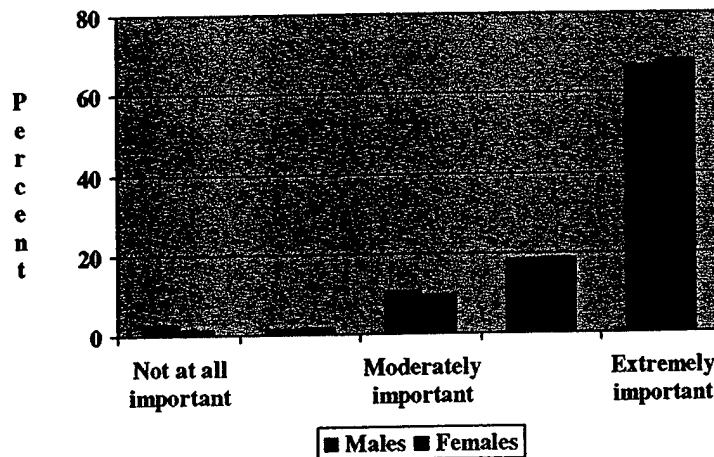
At Time 1, we asked all participants the extent to which Money, Housing, Family, Other Relationships, Violence, and Legal Issues were problems for them the year before they enlisted. We also asked how much each of these areas influenced their decision to join the USMC.

Attrition and Difficulties Influencing Decision to Join the USMC

- Those who were influenced by two or more of these issues had higher attrition than average (18.3% males, 22.5% females).
- For men, being influenced “a great deal” to join by *any* of these issues was related to much higher-than-average attrition.

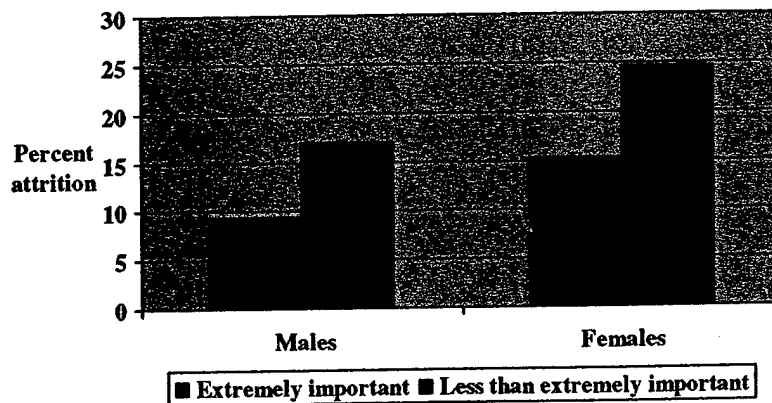
Those who were influenced by two or more of these issues to any extent were more likely to attrite than those who were influenced by none or only one of these issues. Males who were influenced by two or more of these issues had attrition rates of 18.3%, compared to 9.1% of the group influenced less, $\chi^2=13.937$, $p<.001$. Females who were influenced by two or more of these issues had attrition rates of 22.5%, compared to 15.2% of those influenced less by these issues, $\chi^2=5.841$, $p<.02$.

How important was it to you to be part of
an “elite force”, “one of the best”?



At Time 1 we asked participants to rate on a 5-point scale how important it was, in joining the Marines, to be part of an “elite force”, one of the best. As the graph above shows, this was very important for most of the recruits, and there was no gender difference.

Importance of being one of the best: Attrition rates during recruit training

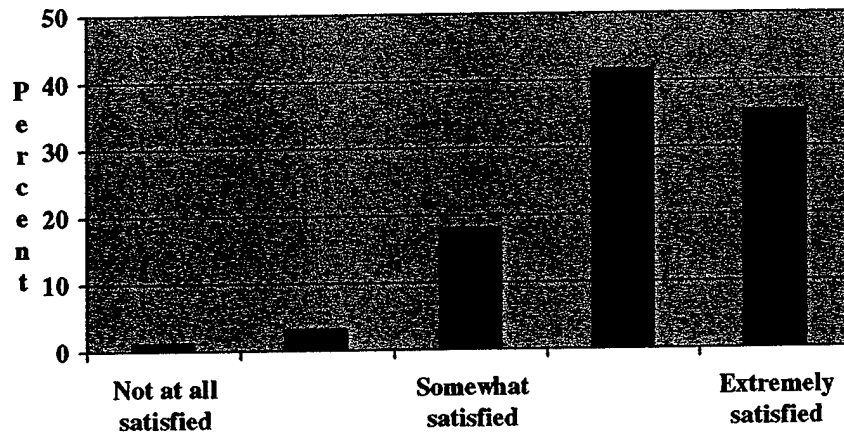


We then looked at attrition related to this reason for joining. We found higher attrition rates for those who did not consider being "one of the best" extremely important. Males who endorsed being one of the best as "extremely important" had an attrition rate of 9.4%, compared to 17.1% of those who rated this as less important, $\chi^2=10.437$, $p<.001$. Similarly, females who endorsed being one of the best as extremely important had an attrition rate of 15.4%, compared to 24.7% attrition in those who rated this as less important, $\chi^2=8.575$, $p<.005$.

The response to this question was not related to attrition after graduating from recruit training. It may be that this question reflects the drive to make it through recruit training and, so, is most important then. Alternatively, those who did not feel that strongly prior to recruit training, but eventually graduated, may have learned to feel more strongly about this because of the training.

Perceptions of Training Experiences

“How satisfied are you with the overall quality of the training you received at Parris Island?”

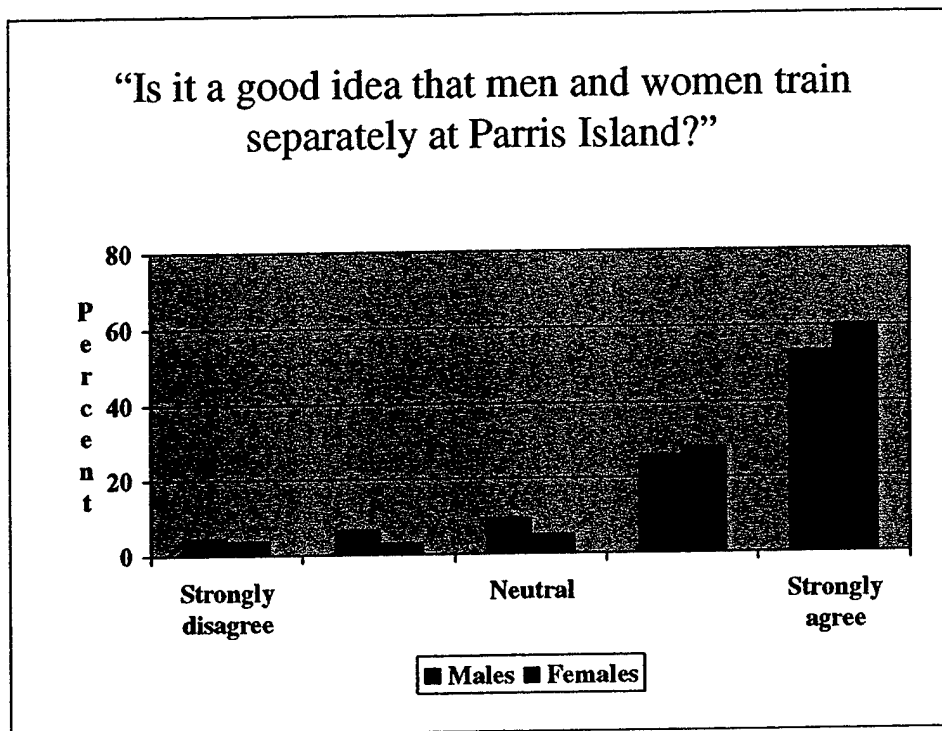


This information was collected at Time 2.

“How satisfied are you with the overall quality of the training you received at Parris Island?”

Not at all satisfied	1.3%
A little satisfied	3.3%
Somewhat satisfied	18.2%
Moderately satisfied	41.7%
Extremely satisfied	35.5%

Individuals who attrited during recruit training endorsed lower levels of satisfaction, with only 54% reporting that they were moderately to extremely satisfied, compared to almost 79% of the graduates. 10% of attritees reported that they were not at all satisfied with recruit training.

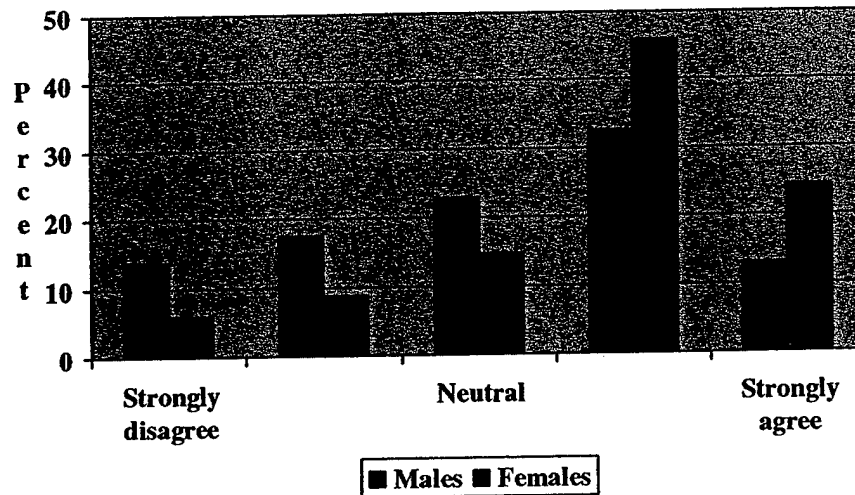


This question came from the Time 4 survey. There was a significant difference in the responses by gender ($p < .05$), with women agreeing more that segregated training at PI is a good idea .

“Is it a good idea that men and women train separately at Parris Island?”

	Male	Female
Strongly disagree	4.5%	3.7%
Disagree	6.5%	3.0%
Neutral	9.6%	5.1%
Agree	26.0%	27.9%
Strongly agree	53.4%	60.3%

“Is it a good idea that men and women train together at MCT?”



This information was also collected at Time 4. There was a significant difference in the responses by gender ($p < .001$), with women agreeing more that integrated training at MCT is a good idea . Only 45.6% of males agreed or strongly agreed that integrated training at MCT was a good idea, compared to more than 70% of female participants.

“Is it a good idea that men and women train together at MCT?”

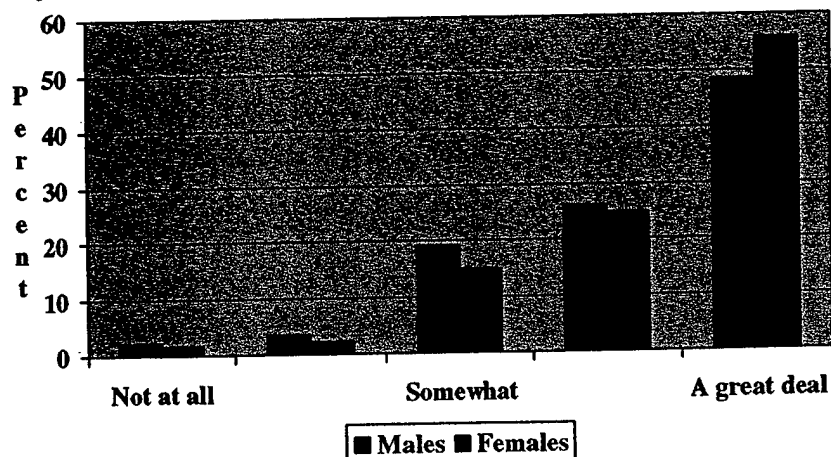
	Male	Female
Strongly disagree	13.8%	6.0%
Disagree	17.6%	8.8%
Neutral	23.0%	14.8%
Agree	32.6%	45.9%
Strongly agree	13.0%	24.4%

The Crucible

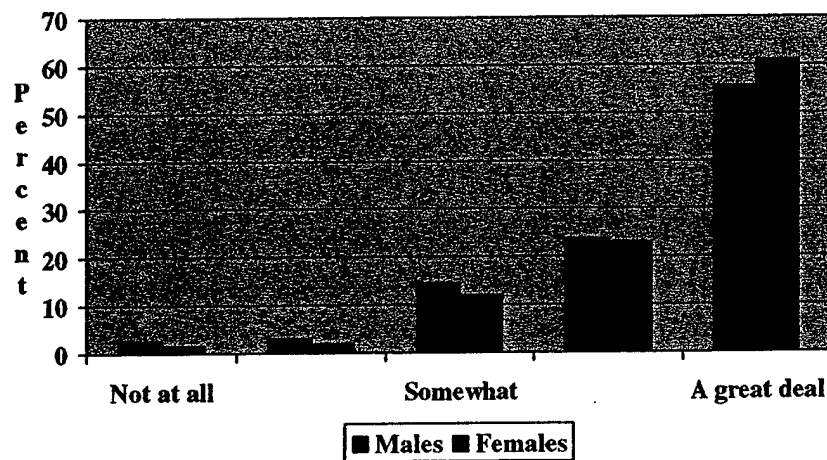
At Time 2, graduates were asked:

- How much did the Crucible increase your
 - Understanding of Marine Corps values
 - Belief in importance of teamwork
 - Commitment to USMC values, fellow Marines, and USMC
 - Mental and physical self-confidence

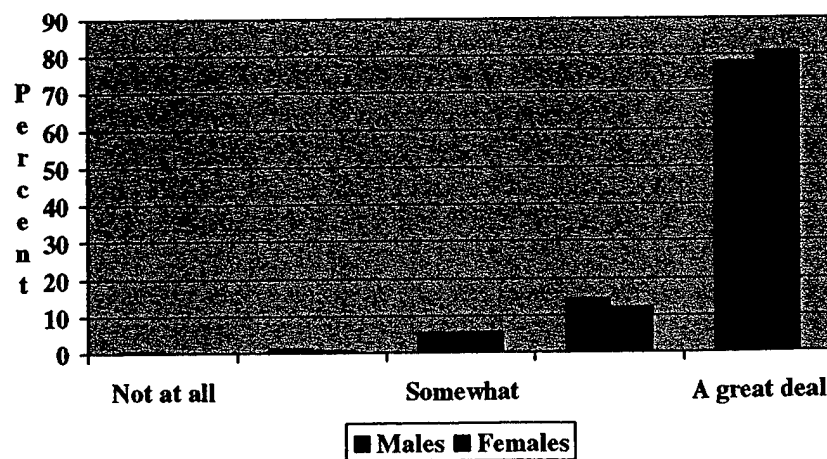
How much did the Crucible increase your understanding of the core values?



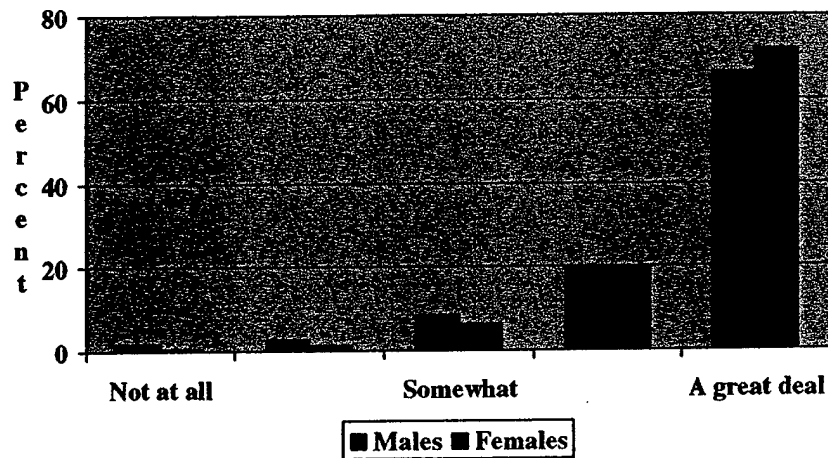
How much did the Crucible increase your commitment to the core values?



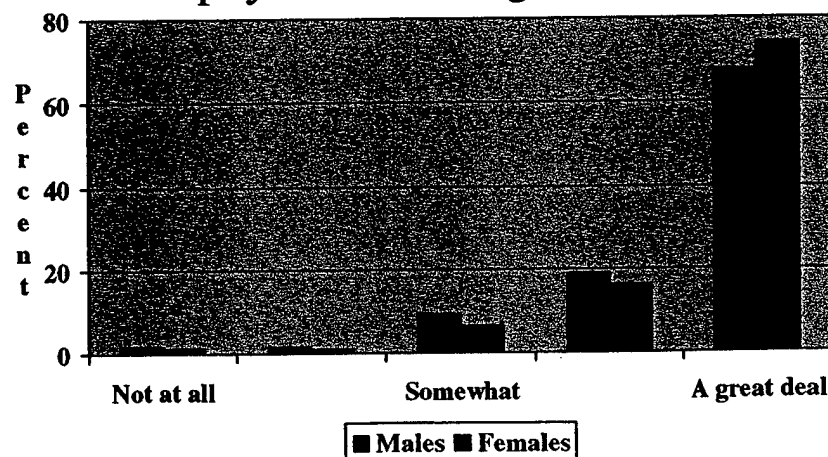
How much did the Crucible increase your belief in the importance of teamwork?



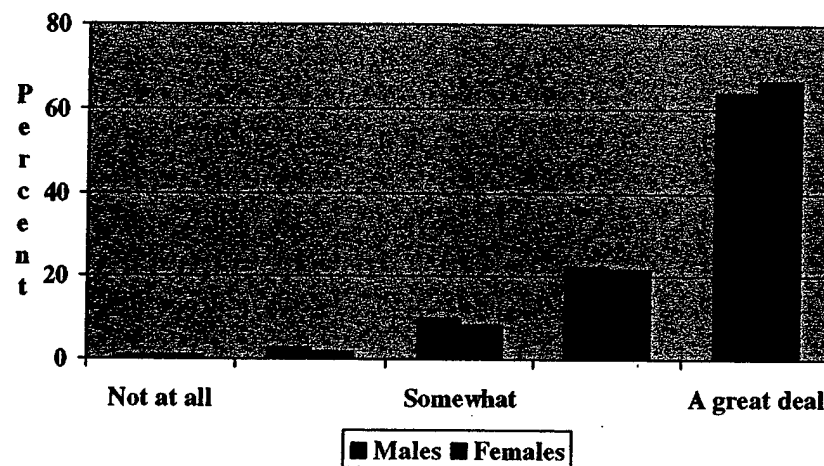
How much did the Crucible increase your confidence in your ability to endure intense mental challenges?



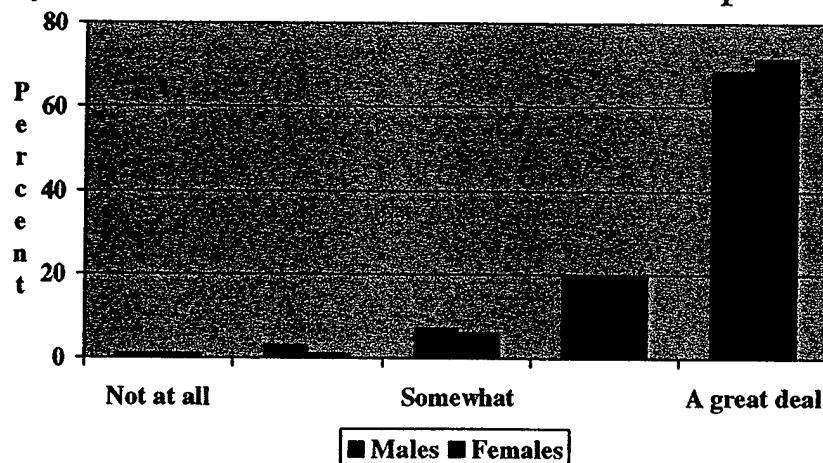
How much did the Crucible increase your confidence in your ability to endure intense physical challenges?



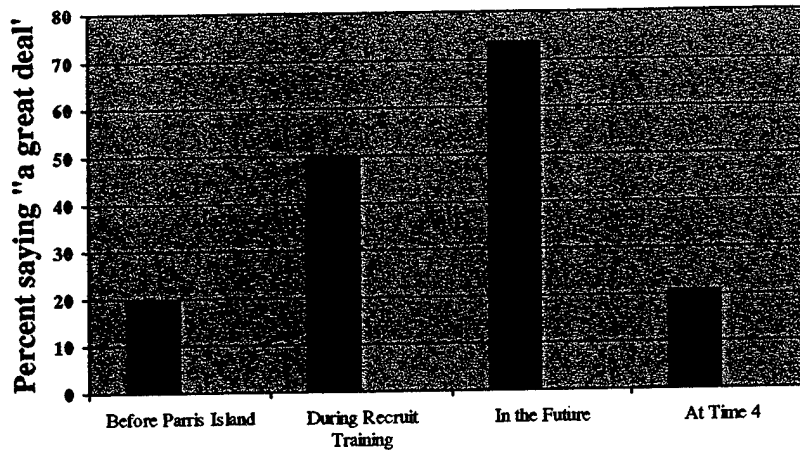
How much did the Crucible increase your commitment to your fellow Marines?



How much did the Crucible increase your commitment to the Marine Corps?



“How much did core values influence your behavior and performance?”



We wanted to find out how much the Marines felt that core values influenced them and their behavior and performance. All responses shown are from participants who had not attrited from the USMC by Time 4.

At Time 2, we asked participants the following questions about the core values:

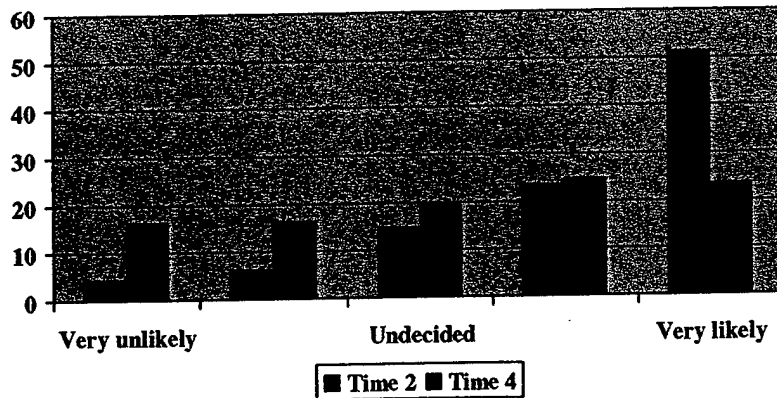
- 1) Before you came to Parris Island, how much did core values influence your behavior and performance (even if you didn't call them that)?
- 2) How much have discussions about core values at Parris Island influenced your behavior and performance during recruit training?
- 3) How much do you think core values will influence your behavior and performance after you graduate?

At Time 4, we asked how much they felt core values had affected their behavior and performance in the past six months.

As the graph above shows, the graduates reported an increasing impact of the core values during recruit training and anticipated an even greater impact once they were in the fleet. Surprisingly, we found that at Time 4, the percent who perceived the core values to have a large impact ("a great deal") on their behavior and performance had decreased substantially.

How do participants feel about
their Marine Corps experience?

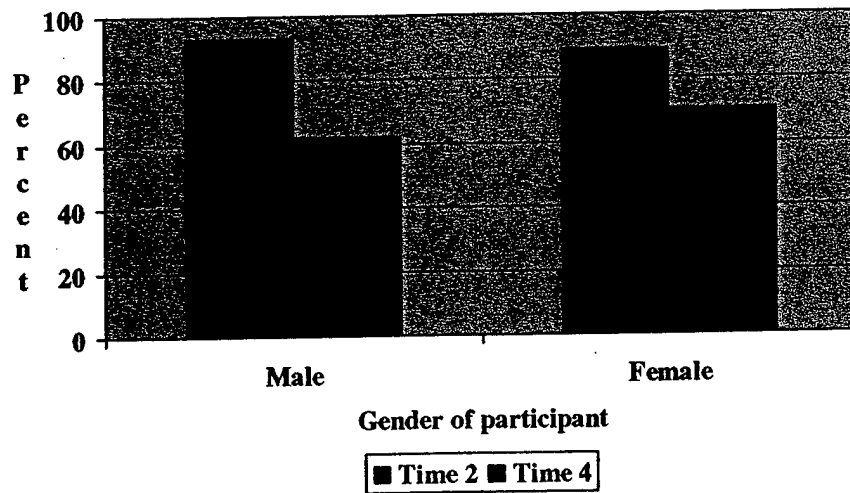
“If you had it to do over again, how likely is it that you would join the Marine Corps?”



The figures shown include only individuals who were still in the USMC at Time 2 and Time 4 respectively. There was no significant difference between male and female participants on this item.

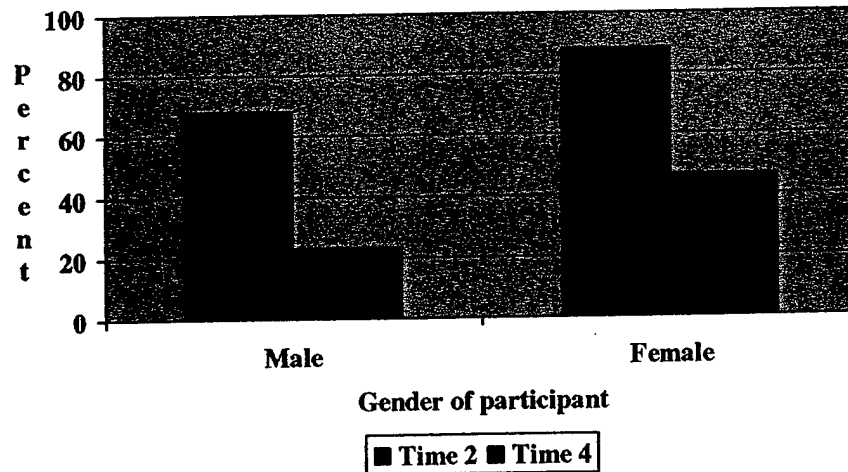
Also, at Time 4 participants were asked if they plan to re-enlist. 73% of participants said they do not plan to re-enlist vs. 27% who said they plan to re-enlist. There was no significant difference by gender on this item.

Percent who would recommend that a male friend enlist in the Marine Corps



At Time 2, 93% of men and 89% of women said they would recommend that a male friend enlist in the USMC, a significant difference ($p < .009$). At Time 4, the proportion recommending that a male friend enlist in the Marines had dropped to 63% for the men and 71% for the women. This is a significant difference by gender ($p < .038$).

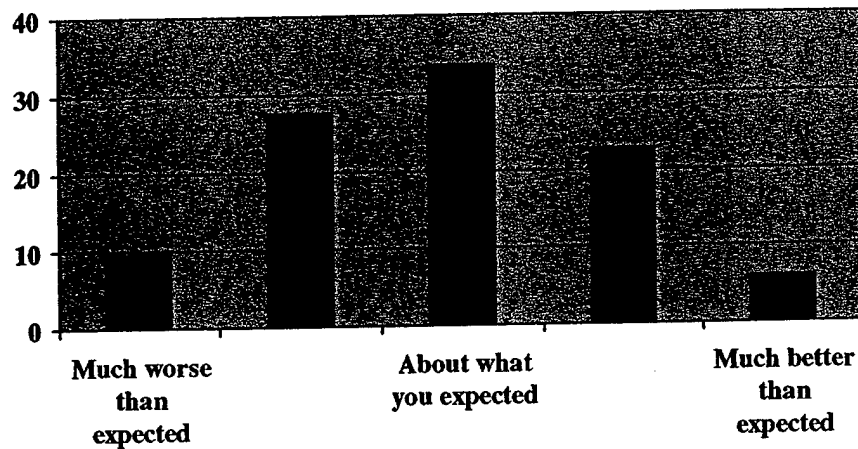
Percent who would recommend that a female friend enlist in the Marine Corps



At Time 2, substantially fewer men said they would recommend that a female friend enlist in the USMC (68%) as compared to recommending a male friend (93%). In contrast, 88% of women said they would recommend that a female friend enlist in the USMC, a significant difference by gender ($p < .001$).

At Time 4, only 23% of men and 47% of women said they would recommend that a female friend enlist in the Marines, a significant difference by gender ($p < .001$). This represents a sharp decrease from Time 2 responses for both genders, and may be reflective of the difficulties participants witnessed or experienced in gender-integrated service after training. At Time 2, participants had just completed the segregated training at Parris Island, compared to Time 4, when participants were in gender-integrated work settings.

“How has your Marine Corps experience been?”



At Time 4, we asked participants if their Marine Corps experience had been better or worse than they expected. 37.4% said it was worse or much worse than they expected, compared to 28.9% who said it was better or much better than expected. There was no significant difference by gender for this item.

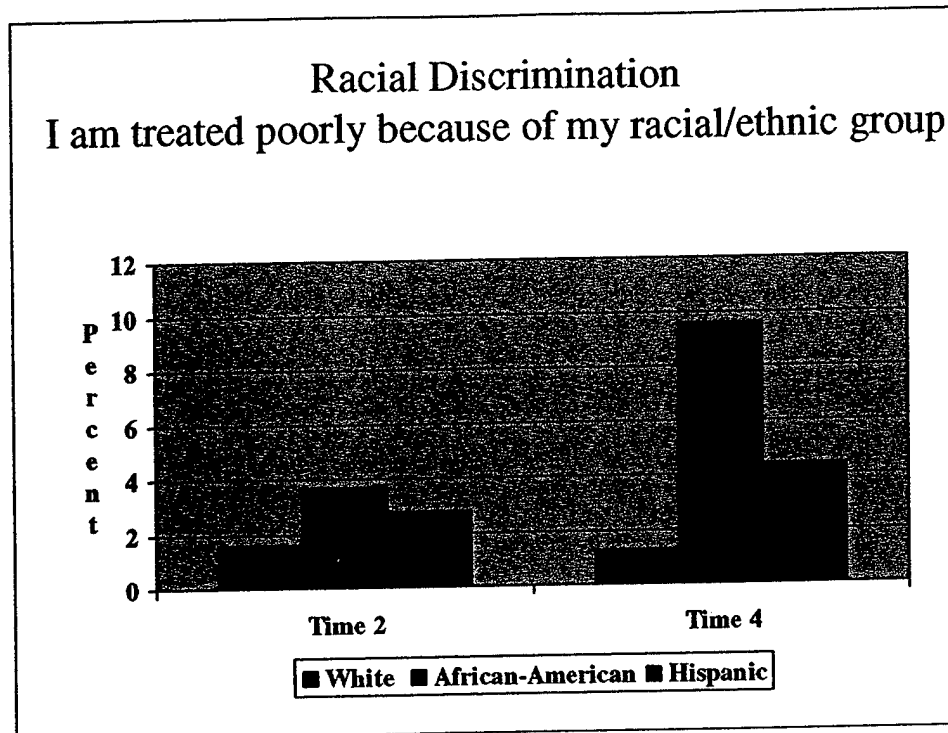
Morale at Time 4

At Time 4, participants report less positive views of their Marine Corps experience if:

- They are dissatisfied with their MOS
- They experience aspects of Marine Corps life as stressful (e.g. privacy issues, homesickness)
- They experience less social support in their workplace
- They experience harassment/discrimination

In addition to the factors listed above, our analyses showed that there were some differences in morale by rank. Those who have achieved a higher rank were significantly more likely to recommend the USMC to a male friend and were more likely to say that their USMC experience had exceeded their expectations. In addition, some trends indicated that people of lower ranks are less likely to be satisfied and less likely to reenlist.

Discrimination and Harassment



One of the things we asked about was participants' experiences of racial discrimination, using an 8-item scale. At both Time 2 and Time 4, minorities scored significantly higher on the total scale than white participants.

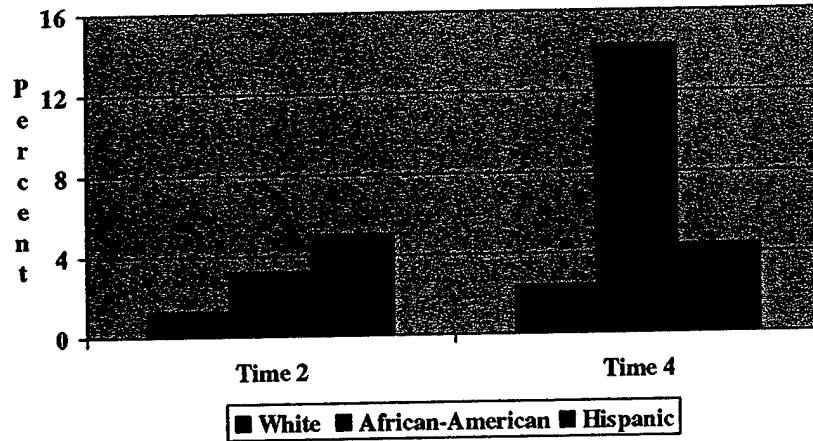
At Time 2 (at the end of recruit training), there were relatively few positive endorsements of racial discrimination. At Time 4 though, endorsements had risen substantially for African-American and Hispanic participants.

Time 2 White: 1.6% African-American: 3.7% Hispanic: 2.8%

Time 4 White: 1.3% African-American: 9.6% Hispanic: 4.4%

Difference between races is significant at $p < .001$ at both time points.

Racial Discrimination I have sometimes been unfairly singled out because of my racial/ethnic group

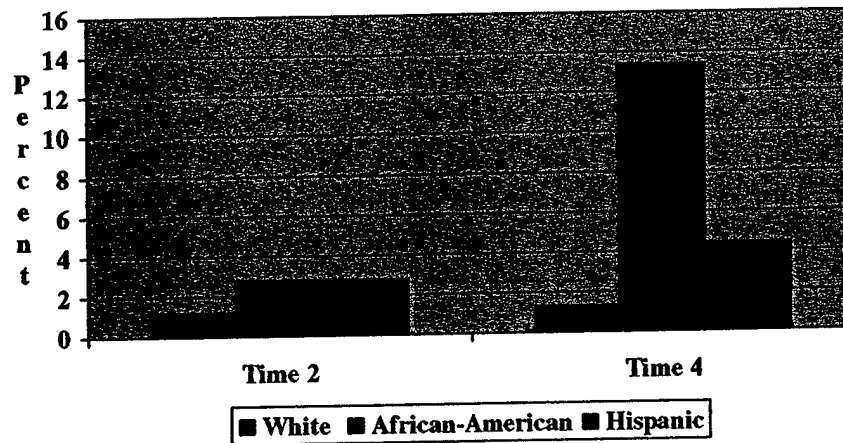


Difference between races is significant at $p < .001$ at both times.

I have sometimes been unfairly singled out because of my racial/ethnic group
(% endorsing positively)

Time 2	White: 1.3%	African-American: 3.2%	Hispanic: 5.1%
Time 4	White: 2.4%	African-American: 14.3%	Hispanic: 4.4%

Racial Discrimination **Racial/ethnic minorities receive fewer opportunities than non-minority Marines**



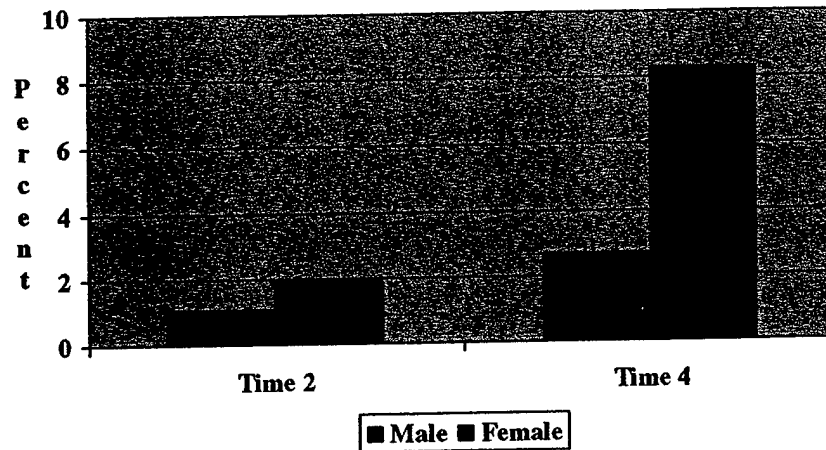
Difference between races is significant at $p < .001$ at both time points.

Racial/ethnic minorities receive fewer opportunities than non-minority Marines
 (% endorsing positively)

Time 2	White: 1.2%	African-American: 2.8%	Hispanic: 2.8%
Time 4	White: 1.3%	African-American: 13.4%	Hispanic: 4.4%

Gender Discrimination

I am treated poorly because of my gender



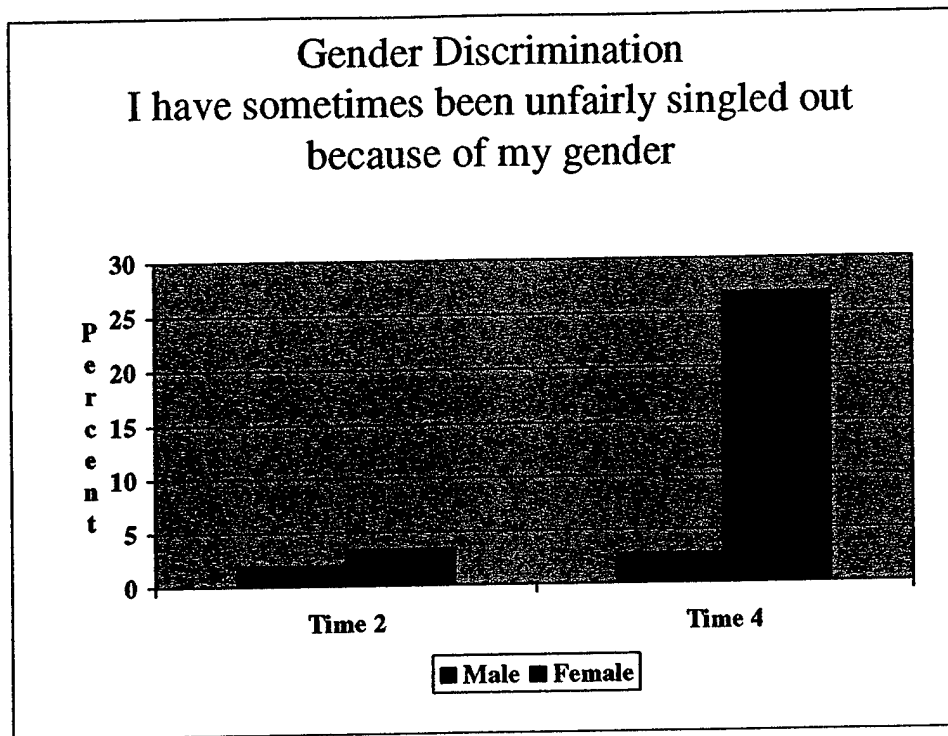
We also asked participants about experiences of gender-based discrimination, using an 8-item scale. At both Time 2 and Time 4, women scored significantly higher on the total scale than male participants.

At Time 2 (at the end of recruit training), there were relatively few positive endorsements of gender discrimination (gender difference significant at $p < .024$). At Time 4 though, endorsements had risen substantially for female participants (gender difference significant at $p < .001$).

“I am treated poorly because of my gender” (% endorsing positively)

Time 2 Female: 1.9% Males: 1.1%

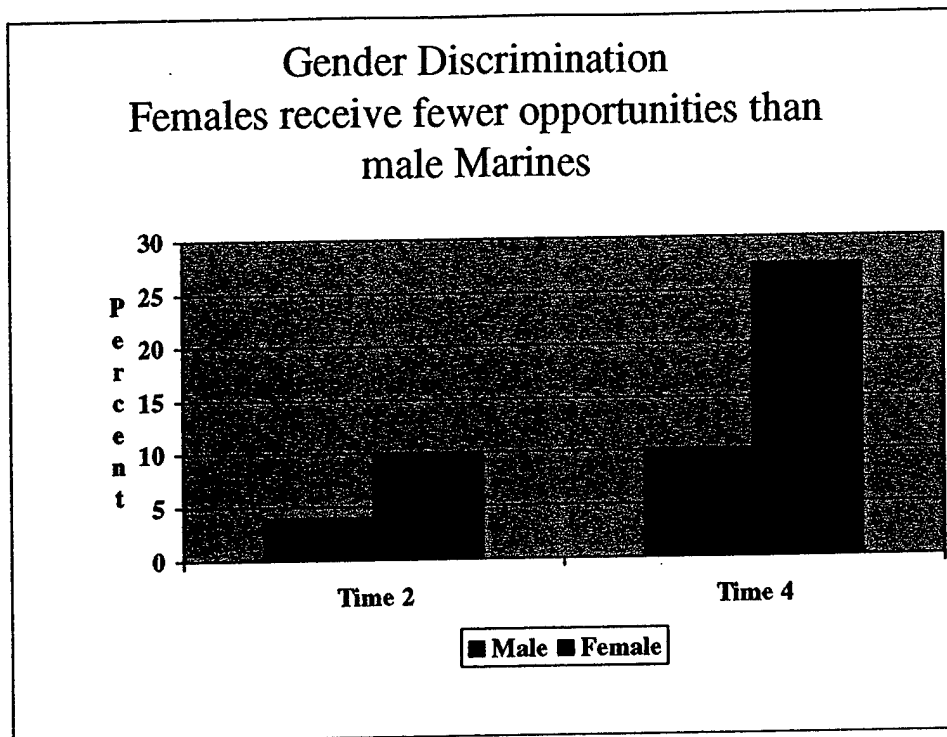
Time 4 Female: 8.3% Males: 2.7%



“I have sometimes been unfairly singled out because of my gender” (% endorsing positively)

Time 2	Female: 3.4%	Males: 1.9%
Time 4	Female: 26.9%	Males: 2.8%

Difference between genders is significant at $p < .005$ at Time 2 and $p < .001$ at Time 4.



Similarly, participants had a worse perception of opportunities for women in the USMC at Time 4 than at Time 2. The difference between male and female participants is significant at both time points ($P < .001$).

Time 2	Female: 10%	Males: 3.9%
Time 4	Female: 27.5%	Males: 10.1%

Sexual Harassment – Time 4

	Males	Females
Experienced harassment *	24%	75%
Experienced unwanted sexual attention*	16%	49%
Sexual coercion*	3%	15%
Sexual assault	3%	6%

* Significant $p < .001$

We administered the Sexual Experiences Questionnaire (SEQ) at both Time 2 and Time 4. At the end of training at Parris Island, we did not see significant differences on the total SEQ scores by gender. 76% of men and 72% of women reported no sexual harassment during their recruit training experience.

The numbers shown above are those reported for workplace incidents at Time 4. Participants were asked to indicate “how often any of your Marine Corps peers or superiors have behaved in the following ways toward you in the last 6 months”. The *gender harassment* subscale included questions about negative gender-related remarks and lewd sexual comments. The *unwanted sexual attention* subscale asked about unwanted physical contact and pressure to engage in romantic or sexual interactions. The *sexual coercion* subscale asked about sexual bribery and threats (e.g., “Implied faster promotions or better treatment if you were sexually cooperative”). The *sexual assault* subscale included items measuring attempted and completed rape. There were significant gender differences for the first three subscales ($p < .001$). Individuals with a history of trauma did not endorse these items at higher rates than individuals without a trauma history.

At Time 4, a total of 8 male participants and 8 female participants reported that a Marine Corps peer or supervisor had sex with them without their consent or against their will. The higher score on the sexual assault subscale for women is the result of more attempted sexual assaults reported by our female participants.

Summary and Implications

- Analyses suggest no single critical screening variable to improve retention
- Trauma experienced prior to joining the USMC may have wide-ranging impact on an individual's adjustment, such as:
 - Inadequate coping skills
 - Poor relationship skills
 - Psychological symptoms such as depression and anxiety
 - High reactivity to stress

These analyses suggest no single screening variable to improve retention. Although experiencing any of a wide range of traumas may put an individual at increased risk for attrition, the majority of trauma survivors do complete recruit training.

Although the presence of premilitary trauma cannot be used to efficiently or effectively screen out recruits, trauma may have a wide ranging impact on the individual's adjustment. Problems with coping, relationships, psychological symptoms, reactivity to stress, and substance use have been documented in numerous military and civilian studies of persons who have experienced trauma.

Implications

Areas for possible intervention include

- Perceived preparedness and self-efficacy
- Teaching coping skills for dealing with stress of training and Marine Corps life
- Providing support for existing coping strategies
- Core values refresher courses
- Continued attention to discrimination and sexual harassment issues

These findings do suggest that intervention programs aimed at reducing premature attrition and improving adaptation might target the level of preparedness, self-efficacy, and initial emotional adaptation to the recruit training environment. While such interventions might be most needed for those with trauma histories, these programs can be beneficial for anyone. It would be advantageous for those developing psychoeducational programs for USMC personnel to consult with trauma experts to adequately take into account the complexities of working with trauma survivors.

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Appendix B

Witnessing Community Violence: Implications for Adaptation in Young Adults

Kiban Turner, Ph.D.
Ashley Dixon, B.A.
Marie Caulfield, Ph.D.
Jessica Wolfe, Ph.D.

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Funding for this project was provided by the Department of Defense, Defense Women's Health Research Program.

Background

- Data are from a large longitudinal study examining attrition from the U.S. Marine Corps
- Data were collected at beginning and end of recruit training
- Current study is based on a larger model that considers the relation of pre-military and military experiences to adaptation

The findings presented here are part of a larger longitudinal study, in which we are following about 1500 Marines from Forming Day 5 of recruit training to 19 months into their enlistment.

Background

- ▣ This presentation will look at the impact on young adults of exposure to community violence while growing up
- ▣ Exposure to community violence in childhood and adolescence has been linked to several outcomes, including increased delinquency and distress
- ▣ Enlisted military sample is at high risk for exposure to community violence

Point one: As part of that, will look at impact of drug abuse by young people in the neighborhood, as well as looking at exposure to violence in the community.

Enlisted military personnel often come from economically disadvantaged areas, such as inner city neighborhoods, where employment and educational opportunities are limited. These areas also often have high rates of community violence and drug abuse.

Description of Participants

	Male N=832	Female n=698
Race (percent)		
Caucasian	66.6	57.7
African American	22.7	17.8
Hispanic	7.8	20.1
Other	2.9	4.3
Age (percent)		
17	9.1	14.0
18	52.0	52.0
19	21.2	16.5
20+	17.7	17.5

The participant pool for the present data includes only active duty Marines with no history of prior military service.

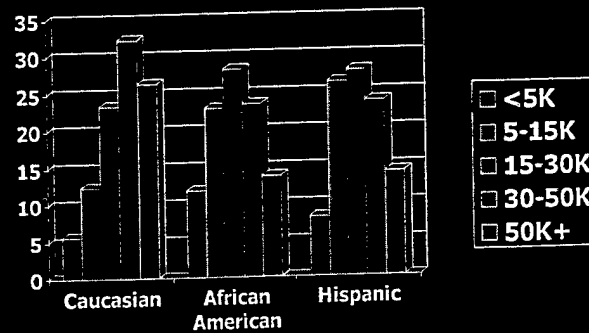
Average age for entire sample is just under 19 years of age.

Note the difference in distribution for Hispanics, particularly the high proportion of Hispanic females in our sample. This is due to the fact that all female Marine recruits go through recruit training at PI, where we collect our data. In contrast, the men go to one of two training sites (one at PI, the other on the West Coast) depending on where they are from. So the sample includes women from the west coast, but men only from east of the Mississippi.

For remainder of analyses, the "Other" group (which includes Asian Americans, Native Americans, and some multiracial individuals) was excluded because they weren't large enough for statistically significant comparisons.

Description of Participants

Total Household Income



This slide shows the distribution of household income by race. Several things are notable here. First, the proportion of non-white participants with a household income of less than \$15,000 (the blue and green bars combined) was much higher for African American and Hispanic participants than for Caucasian participants.

- Caucasians = 17.9%, African American = 34.7%, Hispanic = 34.4%

This chart shows the total income for both genders combined. There was some difference in distribution by gender for all races, with women endorsing incomes of less than \$15,000 at a higher rate than men.

Significant differences on mean total household income:

Males – Caucasian and AA, Caucasian and Hispanic

Females – Caucasian and AA, Caucasian and Hispanic

Measures

- Community violence was measured using questions from the National Survey of Adolescents done by the National Crime Victims Center.
 - Three broad questions asked how much of a problem was violence in school, neighborhood, and drug abuse for young people in the neighborhood
 - Participants were asked if they had ever witnessed any of six types of violent acts, including seeing someone mugged, beaten, stabbed, shot or raped

All data was collected as part of a large survey. Participants completed a battery of self-report instruments on day 5 of recruit training.

Measures

- Delinquency was measured using nine questions
 - Threats or harm to others
 - Harming or killing animals
 - Theft or destruction of other's property
 - Arrested as juvenile or adult
 - Gang membership

Did you often start physical fights with others while you were growing up?

Did you ever hurt or kill an animal on purpose while you were growing up?

Did you ever steal or damage someone else's property on purpose?

Did you ever threaten to hurt someone?

Did you ever start a fire on purpose? (Do not count fires you were supposed to start)

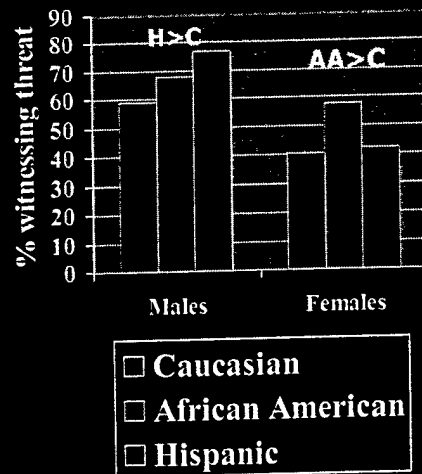
Were you ever arrested as a juvenile or sent to juvenile court?

Were you ever arrested as an adult?

Have you ever burned or branded yourself on purpose or had someone else do it for you?

Have you ever been in a gang?

Have you ever actually seen someone threaten someone with a gun, knife, or other weapon?

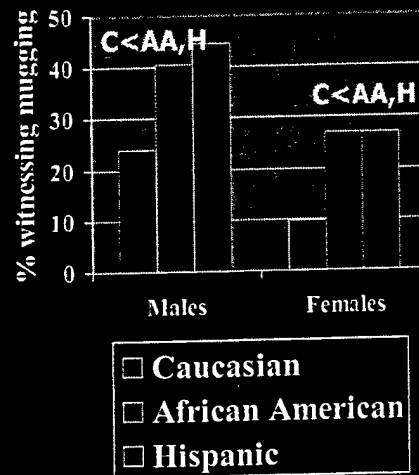


This graph shows participants' response levels to the question *"Have you ever actually seen someone threaten someone with a gun, knife, or other weapon?"*

As shown, almost 60% of Caucasian males, 70% of African American males, and just under 80% of Hispanic males reported witnessing someone being threatened with a weapon. The difference between groups is significant for Caucasian and Hispanic only.

For the women, around 40% of Caucasian and Hispanic females reported witnessing such an event. Almost 60% of African American women in our sample endorsed this question. The difference between African American and Caucasian female participants was significant.

Have you ever actually seen someone being mugged or robbed?

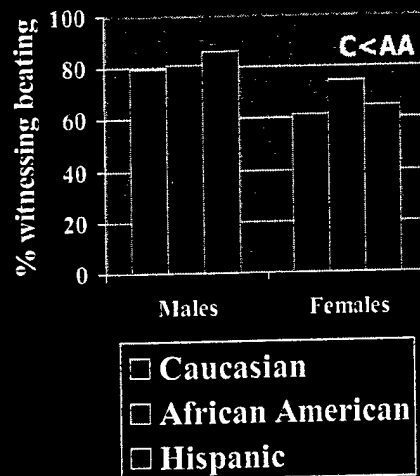


This graph shows participants' response levels to the question *"Have you ever actually seen someone being mugged or robbed?"*

As shown, 24% of Caucasian males reported that they had witnessed a mugging, compare to more that 40% of African American and Hispanic males. The rate of positive endorsement was significantly lower for Caucasian males compared to AA and Hispanics.

For the women, less than 10% of Caucasian females reported witnessing a mugging, compared to 27% endorsement rates by African American and Hispanic women. This difference was significant.

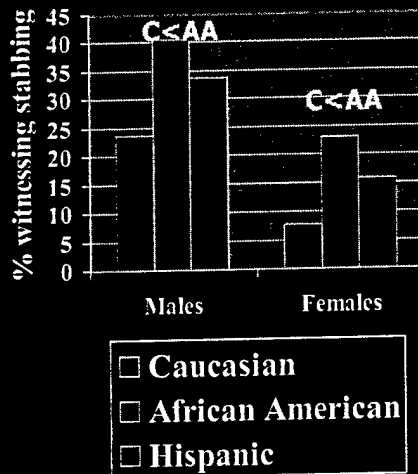
Have you ever actually seen someone being beaten up, hit, punched or kicked such that they were hurt pretty badly?



This graph shows participants' response levels to the question *"Have you ever actually seen someone being beaten up, hit, punched or kicked such that they were hurt pretty badly?"*

For the men in our sample, endorsement rates were very high, with about 80% of participants from all three racial groups endorsing this question. Rates were slightly lower for the women participants, with around 60% of Caucasian and Hispanic females reporting that they had witnessed a severe beating, and 75% of African American participants positively endorsing this item. The difference between Caucasian and African American females was significant; all other group differences were non-significant.

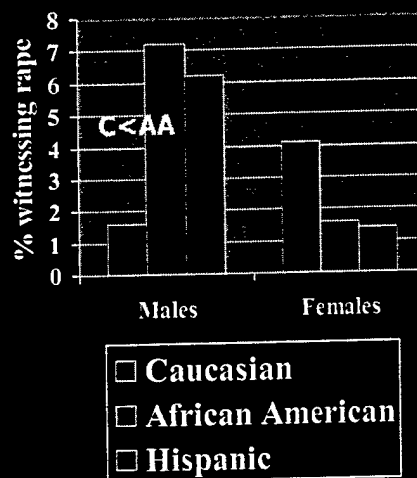
Have you ever actually seen someone cut or stab someone else with a knife?



This graph shows participants' response levels to the question "*Have you ever actually seen someone cut or stab someone else with a knife?*"

Responses for African Americans were significantly higher than for Caucasians, for both male and female participants. More than 40% of African American male participants positively endorsed this question, vs. less than 35% of Hispanics and less than 25% of Caucasian male participants. More than 20% of African American women positively endorsed this, compared to 15% of Hispanic women, and less than 8% of Caucasian women.

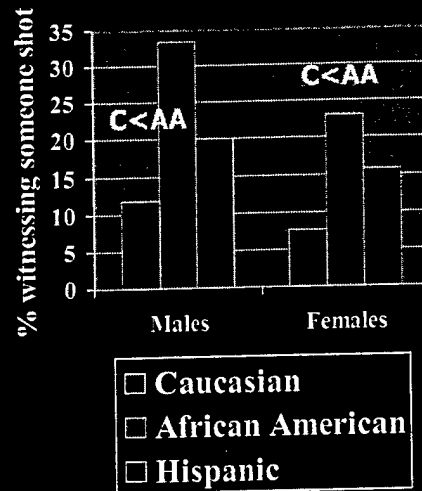
Have you ever actually seen someone sexually assault or rape someone else?



This graph shows participants' response levels to the question "Have you ever actually seen someone sexually assault or rape someone else?"

Overall, this item has a low overall endorsement rate for all groups. African American males did endorse this at a significantly higher rate than Caucasian males. All other group differences were non-significant.

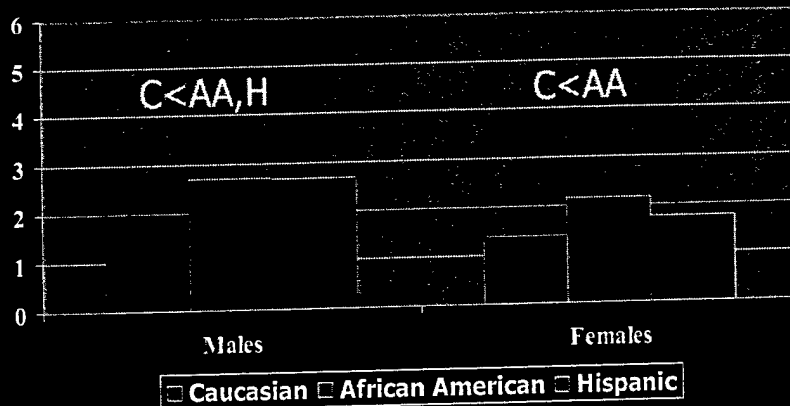
Have you ever actually seen someone shoot someone else with a gun?



This graph shows participants' response levels to the question "*Have you ever actually seen someone shoot someone else with a gun?*"

Responses for African Americans were significantly higher than for Caucasians, for both male and female participants. Almost 35% of African American male participants positively endorsed this question, vs. 20% of Hispanics and 12% of Caucasian male participants. More than 20% of African American women positively endorsed this, compared to 15% of Hispanic women, and less than 8% of Caucasian women.

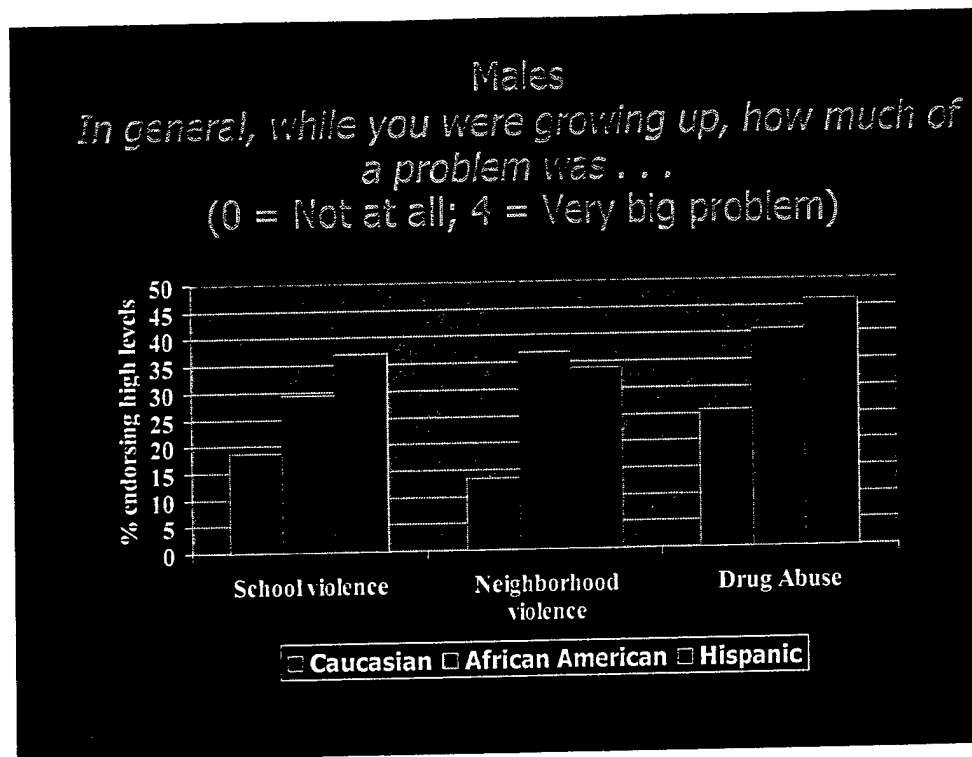
*Incidence of witnessing different types of violent acts
(0 = Never; 6 = Witnessed 6 different types of
violent acts (maximum score))*



*Differences between Caucasian and All other for males and females significant at $p < .01$

This graph shows the average total score of witnessing violent acts. This total is based on participants' responses to the six items just shown asking them if they had ever witnessed various types of violent acts. For male participants, Caucasians had a significantly lower average than African Americans or Hispanics. As you can see, prevalence was relatively high for all groups, with Caucasians reporting witnessing 2 different types of violent acts on average, and African Americans and Hispanics endorsing witnessing almost 3 types of violent acts.

Averages were lower for the female participants. Caucasians had a significantly lower average than African American women, but did not have a significantly different average than Hispanics.

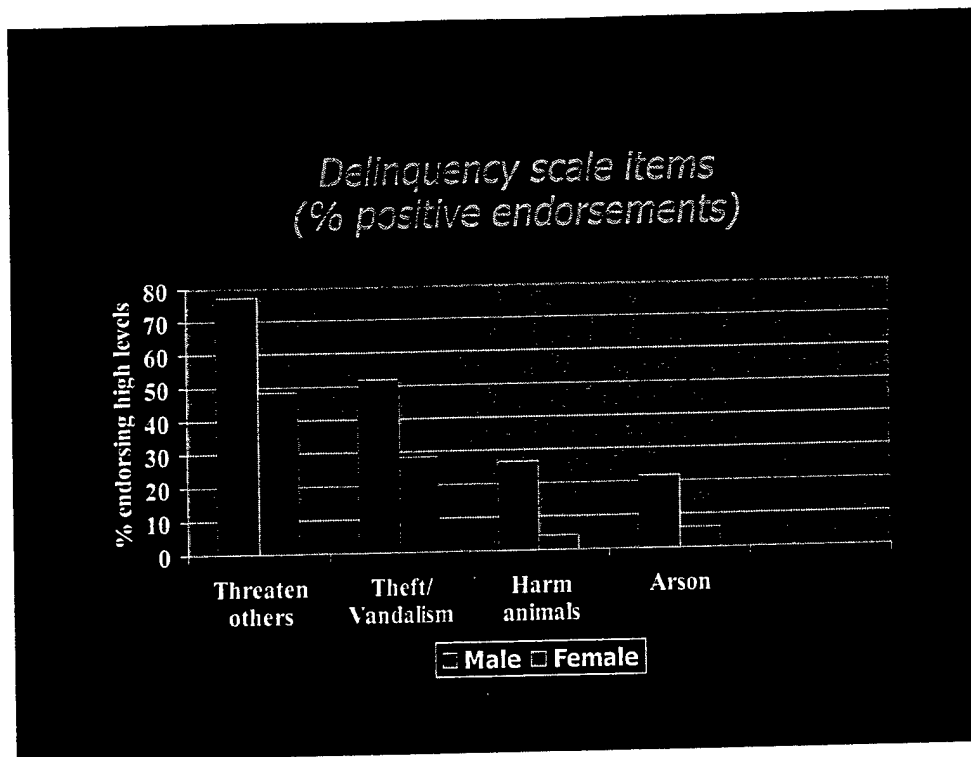


This graph shows mean responses to the questions *"In general, while you were growing up, how much of a problem was violence in your neighborhood?, in your school? And How much of a problem was drug buse for young people in your neighborhood?"* for male participants.

School: Mean for Caucasian men was significantly lower than for AA or Hispanics.

Neighborhood: As shown, Caucasian subjects endorsed this question at lower levels than African American or Hispanic participants. The mean for Caucasian men on this item was significantly lower than for African American and Hispanic men.

Drug Abuse: Hispanic men showed the highest endorsement of severe levels – with more than 45% reporting that drug abuse was a big or very big problem in their neighborhood growing up. The mean for this item was significantly higher for Hispanics than for Caucasians; African Americans did not differ significantly from the other groups.

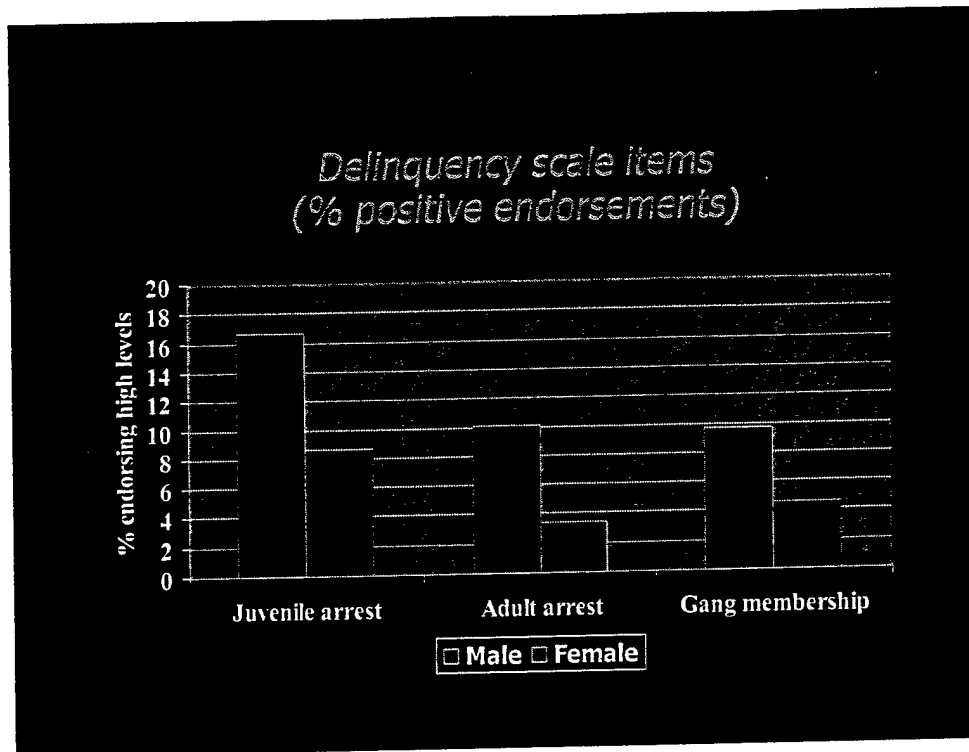


This graph shows mean responses to the questions *"In general, while you were growing up, how much of a problem was violence in your neighborhood?, in your school? And How much of a problem was drug abuse for young people in your neighborhood?"*

School: Mean for Caucasian women was lower than for AA or Hispanics, but not significantly so.

Neighborhood: As shown, Caucasian subjects endorsed this question at lower levels than African American or Hispanic participants. The mean for Caucasian women on this item was significantly lower than for African American and Hispanic women.

Drug Abuse: This item showed the greatest endorsements at high levels of severity for the women, with over 30% of all participants of all races stating that drug abuse was a moderate to severe problem in their neighborhood. There were no significant differences in group means for this item by race.



This graph shows mean responses to the questions "In general, while you were growing up, how much of a problem was violence in your neighborhood?, in your school? And How much of a problem was drug abuse for young people in your neighborhood?"

School: Mean for Caucasian women was lower than for AA or Hispanics, but not significantly so.

Neighborhood: As shown, Caucasian subjects endorsed this question at lower levels than African American or Hispanic participants. The mean for Caucasian women on this item was significantly lower than for African American and Hispanic women.

Drug Abuse: This item showed the greatest endorsements at high levels of severity for the women, with over 30% of all participants of all races stating that drug abuse was a moderate to severe problem in their neighborhood. There were no significant differences in group means for this item by race.

Predictive Model

- Linear regression was run separately by gender using the following independent variables to predict delinquency:
 - Race
 - Total household income in past year
 - Community violence – problem in neighborhood
 - Community violence – problem in school
 - Community violence – problem with drug abuse
 - Community violence – summary of witnessing violent acts

We next tested a predictive model by running a regression with the variables listed here.

Predictive Model

- Regression was done in two stages:
 - Step 1: Race and household income
 - Step 2: Community violence variables
- Step 1 alone was not significant for males or females
- Final model (steps 1 and 2) was significant for males and females at the $p < .001$ level

Predictive Model

	Male N=832	Female n=698
Beta weights		
Race	-.237*	n.s.
Household income	n.s.	n.s.
CV- neighborhood	n.s.	n.s.
CV-school	n.s.	n.s.
CV-drug abuse	.171*	.237*
CV-sum of witnessing	.656*	.341*
Adjusted R Square	.190	.129

*p<.05

The full model showed that for males race, drug abuse in neighborhood, and summary of violent acts witnessed predicted delinquency, with an adjusted R square of 19%. Household income and community violence in the schools showed a trend towards predicting delinquency for male participants.

For females, drug abuse in neighborhood and summary of violent acts witnessed were the only two variables that predicted delinquency, with an adjusted R square of 12.9%.

We looked at number of other variables to see if community violence predicted them, including adult substance use, depression and anxiety in adulthood, as well as attrition from the military. No predictive relationship was found between exposure to community violence and any of these factors.

Summary

- Exposure to community violence was found to predict delinquency
- Exposure to community violence did not predict depression, anxiety, attrition, or pre-military substance use

Appendix C

Training Preparation, Self-Efficacy,
and Emotional Adaptation:
Impact on Marine Corps Attrition

Kiban Turner, Ph.D.
Ashley Dixon, B.A.
Marie Caulfield, Ph.D.
Jessica Wolfe, Ph.D.

Rationale for Study

- Rates of first-term, non-EAS attrition of Marines are high, particularly for female Marines
- Previous research has focused primarily on demographic variables and physical fitness
- Current study is based on a larger model that considers the relation of pre-military and military experiences to adaptation

Proximal/Distal Model

- Present findings are part of larger longitudinal study evaluating wide range of proximal and distal factors related to attrition, including:
 - Pre-military risk and resiliency factors, e.g., school history, trauma history, drug use, etc.
 - Factors in the military environment, e.g., unit cohesion, quality of life, etc.
 - Interactions between pre-military and current factors

Description of Participants

	Male N=832	Female N=698
Race (percent)		
Caucasian	70.8	69.9
African American	23.4	20.2
Other	5.8	9.9
Age (percent)		
17	9.1	14.0
18	52.0	52.0
19	21.2	16.5
20+	17.7	17.5
Recruit training attrition (percent)	11.9	17.6

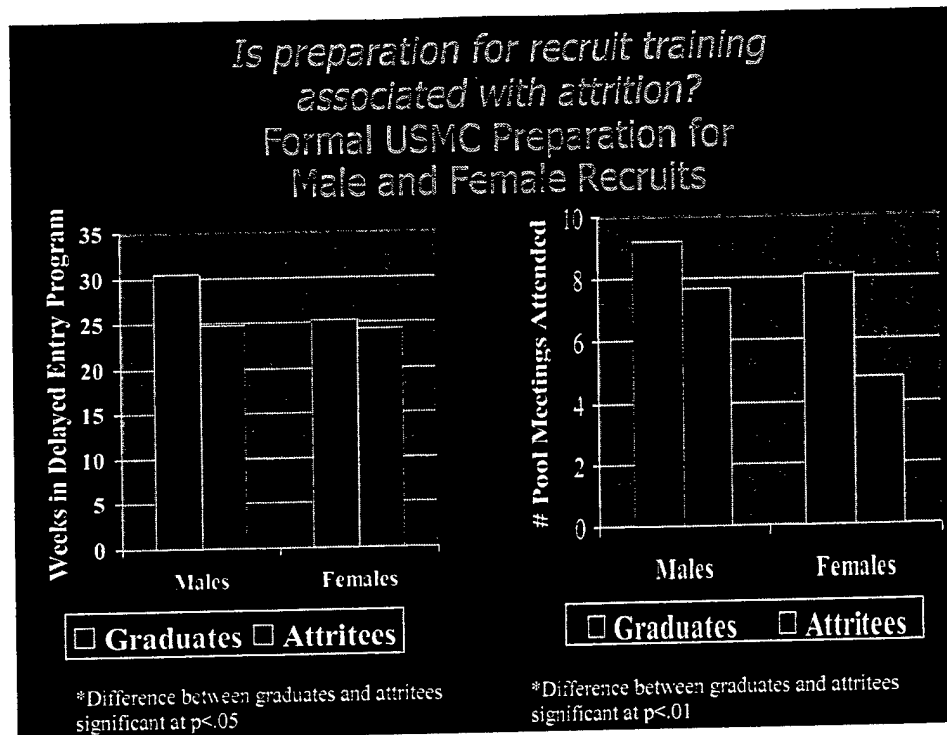
The participant pool for the present data includes only active duty Marines with no history of prior military service.

Note that attrition rates for males and females in this study are lower than those reported for USMC recruits during fiscal years 95-97 when annual attrition rates were approximately 13.5% for males and 24.5% for females.

The lower rates of attrition in the present study may reflect seasonal variation in attrition as recruits enrolled in this study all entered training during the months of May-August 1997. Previous analyses have suggested that recruit training attrition rates may be lower during the summer months and higher during winter and early spring.

Preparation for Training

- Recruits' level of involvement in formal USMC preparation was assessed.
 - Delayed Entry Program (DEP)
 - Pool meetings
- Recruits' level of perceived personal preparedness was assessed with single question: "How well did your recruiter prepare you for recruit training?"



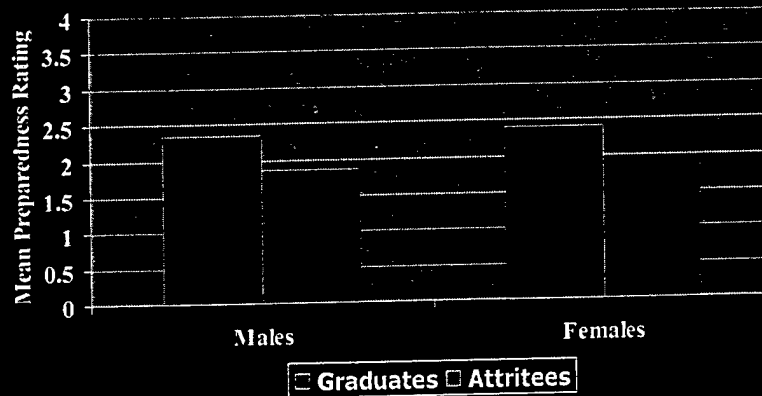
The variables that were used to assess preparation for recruit training included both amount of involvement in formal USMC preparation as well as the recruits' perceived level of personal preparedness.

This graph shows data for two formal preparation variables, number of weeks in the delayed entry program (left graph), and number of pool meetings attended (right graph).

The left graph shows that males who eventually graduated were in DEP significantly longer than those who attrited. In contrast, there was no difference in time in DEP for female graduates versus attritees.

The right graph shows that females who graduate attended, on average, almost twice as many pool meetings as those who attrited. This difference was statistically significant. In contrast, there was no significant difference in the number of pool meetings attended for male graduates versus attritees.

*Is preparation for recruit training
associated with attrition?*
How well did your recruiter prepare you for recruit
training? (0 = Not at all; 4 = Extremely well)



*Differences between graduates and attritees for males and females significant at $p < .01$

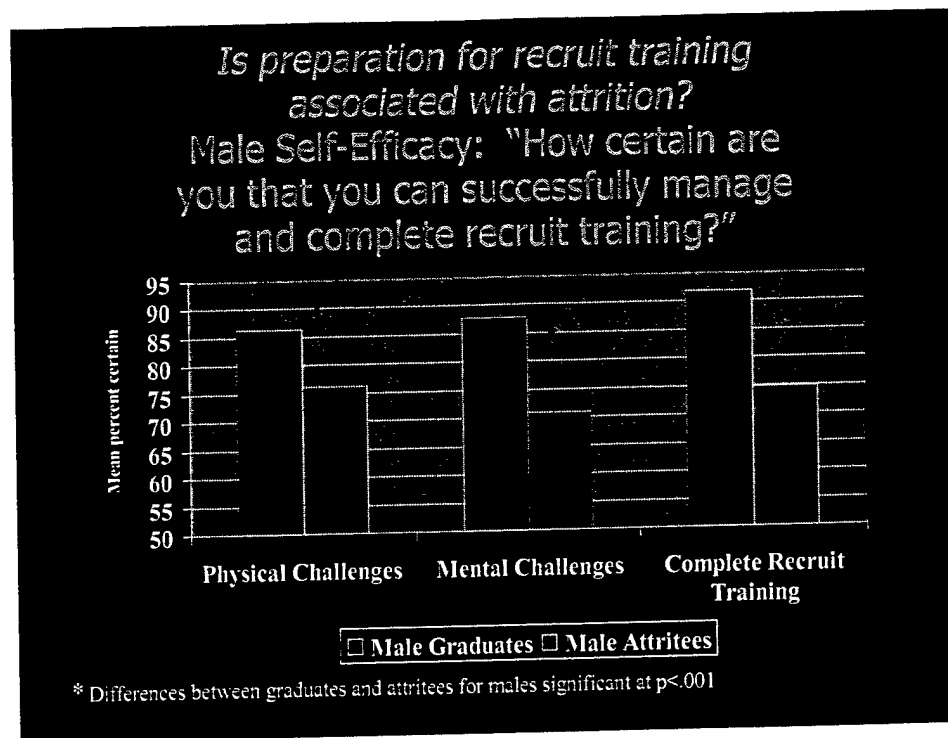
This graph shows mean responses to the question "How well did your recruiter prepare you for recruit training?" As shown, both male and female recruits who eventually graduate report feeling significantly more prepared for recruit training on forming day 5 than those who eventually attrite.

Self-Efficacy

- Recruits were asked how certain they were that they could
 - Meet physical challenges of recruit training
 - Meet mental challenges of recruit training
 - Complete recruit training
 - Responses were percent certain 0%–100%

Although these initial data are promising, at this point they provide no single screening variable that would be useful in predicting attrition. However, the data do suggest that intervention programs aimed at reducing premature attrition and improving adaptation might target the level of preparedness, self-efficacy, and initial emotional adaptation to the recruit training environment.

The current briefing provided simple univariate analyses for recruit training attrition only. Later results from this study will provide information on more comprehensive multivariate models that also look at attrition at later points as well. Multivariate models are likely to better reflect the complexity of the topics under study.

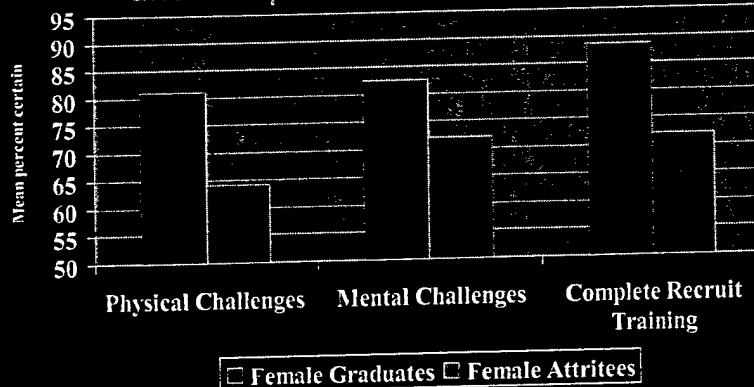


The term self-efficacy is used to describe the extent to which one feels capable of successfully doing what one needs to do. We assessed the self-efficacy of recruits by asking how certain they were that they could: 1) meet the physical challenges of recruit training; 2) meet the mental challenges of recruit training; and 3) complete recruit training.

For both males and females, those who eventually graduated had significantly higher mean scores on all three questions than those who eventually attrited.

It should be noted that most of the participants were confident about their success, with more than 80% of both males and females reporting that they were 80%-100% certain that they would complete training. Of those who were at least 80% certain they would graduate, 8.2% of the males and 13.6% of the females eventually attrited. In contrast, of those who were less confident (70% or less), 32% of the males and 33% of the females attrited.

Is preparation for recruit training associated with attrition?
 Female Self-Efficacy: "How certain are you that you can successfully manage and complete recruit training?"



* Differences between graduates and attritees for females significant at $p < .001$

The term self-efficacy is used to describe the extent to which one feels capable of successfully doing what one needs to do. We assessed the self-efficacy of recruits by asking how certain they were that they could: 1) meet the physical challenges of recruit training; 2) meet the mental challenges of recruit training; and 3) complete recruit training.

For both males and females, those who eventually graduated had significantly higher mean scores on all three questions than those who eventually attrited.

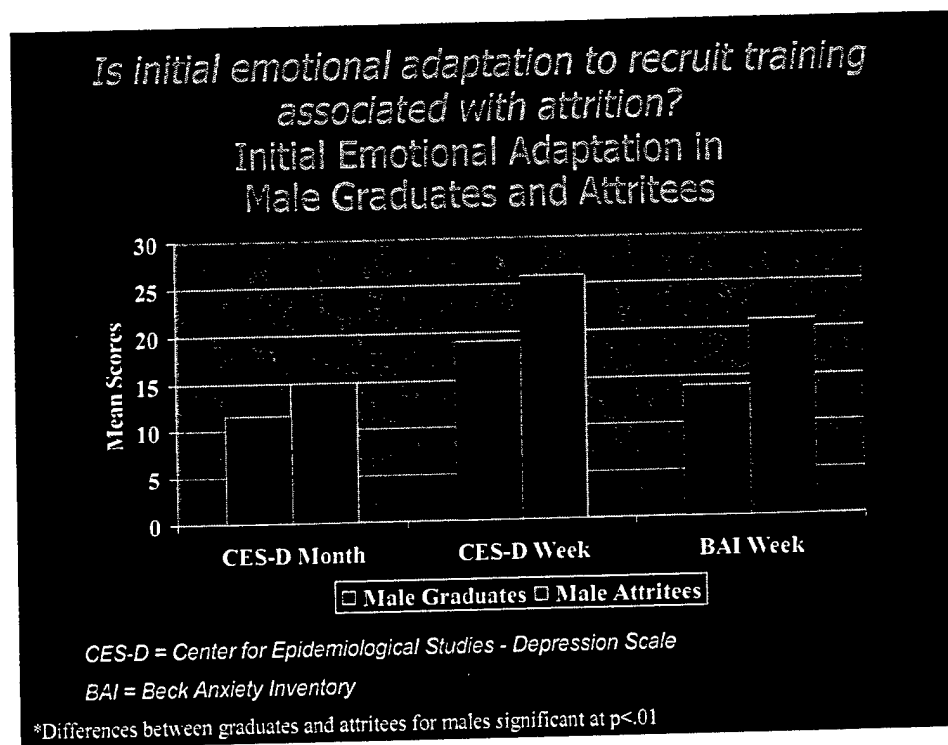
It should be noted that most of the participants were confident about their success, with more than 80% of both males and females reporting that they were 80%-100% certain that they would complete training. Of those who were at least 80% certain they would graduate, 8.2% of the males and 13.6% of the females eventually attrited. In contrast, of those who were less confident (70% or less), 32% of the males and 33% of the females attrited.

Emotional Adaptation

- ▣ Recruits were asked about depression and anxiety symptoms using the following
 - ▣ Center for Epidemiological Studies Depression Scale (CESD)
 - | Administered for both the past month and past week
 - ▣ Beck Anxiety Inventory (BAI)
 - | Administered for past week

Although these initial data are promising, at this point they provide no single screening variable that would be useful in predicting attrition. However, the data do suggest that intervention programs aimed at reducing premature attrition and improving adaptation might target the level of preparedness, self-efficacy, and initial emotional adaptation to the recruit training environment.

The current briefing provided simple univariate analyses for recruit training attrition only. Later results from this study will provide information on more comprehensive multivariate models that also look at attrition at later points as well. Multivariate models are likely to better reflect the complexity of the topics under study.



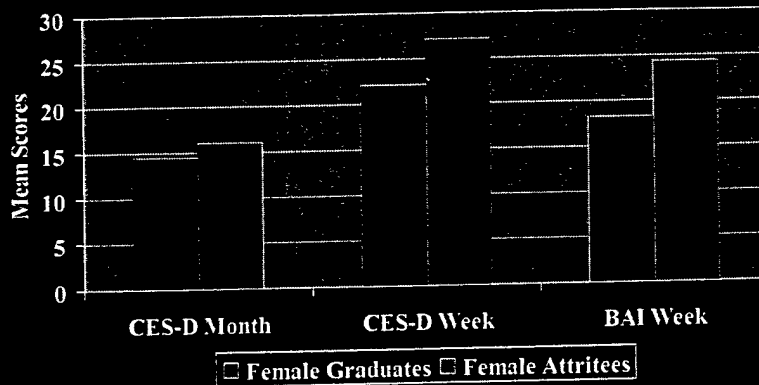
This graph shows mean scores on the depression and anxiety measures for male and female graduates and attritees.

While male attritees had significantly higher mean depression scores for the past month than males who eventually graduated, there was no difference between female graduates and attritees on this measure.

In contrast, both male and female attritees had significantly higher mean depression and anxiety scores for the past week (i.e., their first week on Parris Island) than male and female recruits who eventually graduated.

*Is initial emotional adaptation to recruit training
associated with attrition?*

*Initial Emotional Adaptation in
Female Graduates and Attritees*



CES-D = Center for Epidemiological Studies - Depression Scale

BAI = Beck Anxiety Inventory

**Differences between graduates and attritees for females significant at $p < .01$*

This graph shows mean scores on the depression and anxiety measures for male and female graduates and attritees.

While male attritees had significantly higher mean depression scores for the past month than males who eventually graduated, there was no difference between female graduates and attritees on this measure.

In contrast, both male and female attritees had significantly higher mean depression and anxiety scores for the past week (i.e., their first week on Parris Island) than male and female recruits who eventually graduated.

Predictive Model

- Logistic regression was run using the following variables:
 - Length of time in delayed entry program
 - Number of pool meetings
 - Perceived preparedness
 - Self-efficacy
 - CESD for past month
 - CESD for past week
 - BAI

Predictive Model

- Shorter length of participation in DEP and lower confidence level predicted attrition for males
 - The model correctly classified 88.59% of male participants

Predictive Model

- Attendance at fewer pool meetings and lower confidence level predicted attrition for females
 - The model correctly classified 82.69% of female participants

Summary

- Areas for possible intervention include
 - Quality and quantity of DEP preparation
 - Perceived preparedness and self-efficacy
 - Emotional adaptation during forming days

Although these initial data are promising, at this point they provide no single screening variable that would be useful in predicting attrition. However, the data do suggest that intervention programs aimed at reducing premature attrition and improving adaptation might target the level of preparedness, self-efficacy, and initial emotional adaptation to the recruit training environment.

The current briefing provided simple univariate analyses for recruit training attrition only. Later results from this study will provide information on more comprehensive multivariate models that also look at attrition at later points as well. Multivariate models are likely to better reflect the complexity of the topics under study.

Appendix D

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Guarantor: M. B. Caulfield

Gender and Trauma as Predictors of Military Attrition: A Study of Marine Corps Recruits

Jessica Wolfe, Ph.D.*, Kiban Turner, Ph.D.*, Marie Caulfield, Ph.D.*,

Tamara L. Newton, Ph.D.*, Katherine Melia, Ph.D.*,

James Martin, Ph.D.[†], and Jill Goldstein, Ph.D.[‡]

*National Center for PTSD, VA Boston Healthcare System, Boston, MA, 02130.

[†] Graduate School of Social Work and Social Research, Bryn Mawr College, Bryn Mawr PA, 19010.

[‡]Harvard Medical School, Harvard University, Boston, MA 02115

Key words: Military, gender, attrition, trauma

U.S. Marine recruits ($n=1530$) were surveyed for premilitary histories of interpersonal trauma to examine the relationship between premilitary trauma and attrition from recruit training. The results show that 47.5% of the men and 68.1% of the women reported a history of at least one interpersonal trauma before entering the Marines. In this study, individuals with a premilitary history of interpersonal trauma were at significantly greater risk for premature attrition; they were 1.4 times more likely to drop out of recruit training than individuals without a premilitary trauma history. This risk was higher for female recruits. Female recruits with a history of interpersonal trauma were about 1.6 times more likely to attrit during recruit training than women without a history of trauma. The results of this study suggest that developing interventions to bolster recruits' coping skills may improve adaptation to the recruit training environment, and thus decrease attrition.

Premature attrition from the military is a significant problem, with almost one-third of all military enlistees failing to complete their initial terms of service.¹ The Department of Defense incurs significant economic and personnel losses when first-term personnel leave before the conclusion of their enlistment.¹ In addition, separation from the military can impact the individual financially, occupationally, and emotionally. In the face of a strong national economy, the military services have had difficulty meeting their recruiting goals, making it especially important that non-end-of-service (non-EAS) attrition be kept as low as possible to ensure a strong military force able to meet a high level of operational requirements.²

Premature attrition of women from the military is of particular concern, with non-EAS attrition for women 30% higher than the average rate for males across all branches of service.³ As the proportion of women in the military increases, this becomes a larger and larger problem. Women currently comprise nearly 14% of the active duty U.S. Armed Forces, and this percentage is expected to grow as more women enlist in all branches of service, including the U. S. Marine Corps (USMC).⁴ The Marine Corps arguably represents the most difficult service environment for women, with a strong male-oriented culture and the fewest women of all the service branches. Despite efforts of the USMC to adapt to its more diverse workforce, problems with first-term retention have been widely observed for females, with rates of non-EAS attrition approximately 1.6 times that of men during the first term of service.⁵

To date, most research examining reasons for premature attrition has focused on demographic variables, rather than on pre-military experiences. However, military personnel with prior stressor backgrounds are at significantly greater risk for poorer adaptation following war-zone exposure.⁶⁻⁸ Moreover, there is a robust association between early stressor exposure and subsequent stressor vulnerability in civilian samples.^{9,10} Taken together, these observations

provide a rationale for examining the role of pre-military stress and trauma and adaptation to the stress of recruit training.

The results of two recent studies support a relationship between premilitary trauma exposure and attrition. Among U.S. Air Force enlisted personnel, recruits with a history of sexual abuse were 2.5 times more likely to fail to complete basic training than those without a history of abuse.¹¹ Naval recruits with different types of premilitary traumas were between 1.5 to 2 times more likely to attrite during recruit training, with the attrition rate varying by gender and type of trauma.¹²

In addition, among enlisted military personnel, rates of pre-military trauma (e.g., childhood physical and sexual abuse) are substantial and exceed civilian rates.¹³⁻¹⁶ In one sample of active duty Army personnel, as many as 58% of women and 35% of men reported experiences of childhood sexual or physical abuse.¹⁵ In a sample of more than 1100 female Naval recruits, 25% reported histories of childhood physical abuse and 53% reported childhood sexual abuse.¹⁷ In addition to child abuse, many military enlistees report histories of other types of interpersonal trauma. In a sample of active duty soldiers in the U.S. Army, 31.2% reported that they had been attacked by someone with a weapon, and 23.6% reported they had been attacked without a weapon, but with intent to injure.¹⁸ A study of female Navy recruits found that 13.7% reported a history of physical assault at age 18 or older.¹⁷ These alarmingly elevated rates of interpersonal traumas in the current military highlight the need for research examining the impact of trauma on military adaptation.

The current study focuses specifically on the impact of pre-military interpersonal trauma on attrition during recruit training in the USMC. The majority of first-term attrition in the U.S. military occurs during the first six months of enlistment, so it is particularly important to understand the factors contributing to attrition during this stage.³ This study is part of a larger

longitudinal study examining how personality characteristics, pre-military, and military experiences are associated with successful adaptation and completion of the first-term enlistment in the Marine Corps. It is the first study to examine trauma and attrition in the USMC. In addition, by examining a wide range of interpersonal trauma, this study expands on the recent studies on sexual abuse and attrition. Methodologically, this study extends the analysis of earlier attrition studies by using survival analysis. Survival analysis enables us to examine factors associated with the length of time an individual stayed in the military before attriting, and to create survival functions to show how long individuals with different characteristics can be expected to remain in the USMC.

Method

Procedure and Participants

The present study is part of a larger longitudinal study that assessed Marine active-duty enlistees at four time points over a 19-month initial enlistment period. This paper examines attrition during recruit training, and uses baseline data collected at the start of the first week of training and subsequent attrition data obtained from the Marine Corps.

Questionnaires were administered to 1530 active duty USMC recruits ($n_{\text{male}}=832$, $n_{\text{female}}=698$) in group settings at MCRD Parris Island between May and August 1997. Participants were informed that their responses were confidential and would not be available to their command structure. All participants completed a demographic questionnaire assessing background characteristics, as well as paper and pencil survey items related to their premilitary background to provide an index of previous, high magnitude stressor experiences (e.g., child abuse, physical assault). They also completed a battery of self-report instruments measuring a variety of

constructs, including mental health and well-being, physical health, and personality variables; these variables are not reported here.

Participants ranged in age from 17 to 34, and most (82.5%) were 19 years of age or younger. Most participants were unmarried at baseline (95.9% of men and 94.5% of women) and had at least a high school education (97.6% of men and 97.5% of women). More than half of the female participants (57.8%) were White non-Hispanic, 17.8% were African-American, 20.1% were Hispanic, and the remaining 4.3% were members of other ethnic groups. Two thirds (66.7%) of the men were white non-Hispanic, 22.7% were African-American, 7.8% were Hispanic, and 2.8% were members of other ethnic groups. The racial distribution for males in this sample is somewhat different than the distribution for males in this age range nation-wide,¹⁹ presumably because Parris Island serves as the training depot only for men from the eastern half of the United States. In contrast, Parris Island is the only training depot for female Marine recruits in the country, and the racial distribution for our female participants is consistent with the national distribution.¹⁹

Measures

Demographics. Demographic information was collected through a questionnaire containing items related to the respondent's age, ethnicity, marital status and educational level.

Attrition. Attrition data were provided by the USMC. For the purposes of this study, attrition included discharge for any reason. While there is a wide range of reasons for discharge, the coding system used by the USMC at the time of this study was imprecise and so attrition by type of discharge was not analyzed.²⁰

Interpersonal trauma. Pre-military interpersonal trauma was measured using items from four self-report measures (Table 1). Multiple measures were used to provide a comprehensive assessment

of types of interpersonal traumas. A positive endorsement of any one item classified the respondent as having a premilitary history of interpersonal trauma.

Childhood Trauma Questionnaire (CTQ).²¹ A 30-item version of the 56-item CTQ assessed childhood traumatic experiences, including neglect, physical and sexual abuse. The validity and reliability of this shortened version of the CTQ has been assessed in a U.S. Army sample.¹⁵ To assess for childhood interpersonal trauma, six questions from this instrument were examined.

Finkelhor Sexual Abuse Screening Questions.²² These four screening questions were developed and used in a national survey to assess for history of childhood sexual abuse.

Sexual Experiences Survey.²³ Two questions from the Sexual Experiences Survey developed by Koss & Oros were included to assess attempted rape and completed rape since age 18.

Diagnostic Interview Schedule.²⁴ Five items from the modified version of the Diagnostic Interview Schedule were included to assess other interpersonal traumatic stressors.

Additional Traumatic Experiences. One open-ended question was included to capture any other type of traumatic experience not already described, and the responses from this narrative question were evaluated for the presence of interpersonal trauma.

Results

Interpersonal trauma

For this study, the sample was split into two groups: those individuals who reported a premilitary history of interpersonal trauma (e.g. rape, physical abuse, sexual abuse, etc.) and those who reported no history of interpersonal trauma. A history of at least one type of interpersonal trauma was reported by 47.5% of male recruits and 68.1% of female recruits. Both rates are substantial, and the difference in trauma rate by gender was significant ($\chi^2=65.095$; $p<.0001$). Rates and gender differences for various types of traumas are shown in Table 2.

Because the base rates of interpersonal trauma and attrition are so much higher in females in our sample, it was more conservative to conduct the subsequent analyses separately by gender. We have included a gender interaction analysis where appropriate.

Retention and Attrition

The overall retention rate during the 63-day recruit training for our sample was 85.2% (for an attrition rate of 14.8%). The first step of our analysis was to examine the ability of gender and trauma to predict whether or not a recruit attrited.

Gender. Looking at our sample by gender, the retention rate through recruit training was 88.1% (95% CI= 85.9% to 90.3%) for males and 81.8% (95% CI= 78.9% to 84.7%) for female recruits. The attrition rate was significantly higher ($\chi^2=11.951$; $p<.001$) for female recruits (18.2%) than for male recruits (11.9%).

Trauma. The retention rate through recruit training for individuals without a history of interpersonal trauma ($n=658$) was 88.0% (95% CI= 85.5% to 90.5%), compared to 83.2% (95% CI= 80.7% to 85.7%) for individuals reporting a history of interpersonal trauma ($n=869$). The attrition rate was significantly higher ($\chi^2=6.852$; $p<.009$) for participants with a history of interpersonal trauma (16.8%) than for participants without a trauma history (12.0%).

Gender and Trauma. The impact of trauma history on attrition varied by gender. For men, the retention rate through recruit training was comparable for recruits with (87.3%; 95% CI= 84.0% to 90.6%) and without (89.0%; 95% CI= 86.0% to 91.9%) premilitary interpersonal trauma ($\chi^2=0.544$; $p<.461$). In contrast, for women the retention rate was 79.8% (95% CI=76.2% to 83.4%) for the female recruits reporting a positive history of interpersonal trauma, and 86.1% (95% CI=81.5% to 90.7%) for those reporting no interpersonal trauma, a significant difference ($\chi^2=4.058$; $p<.027$).

Event Time Analysis of Attrition

The second part of our analysis involved measuring the number of training days completed before attrition (event time analysis). In our sample, all attrition occurred between training day 0 and day 58, with a median of training day 23.

Gender. Kaplan-Meier survival analysis was used to analyze the time to attrition. Figure 1 shows the Kaplan-Meier plot of attrition by gender for our sample. Looking at a given point in time, the plot shows that the probability of a male participant staying more than 50 days is 89%, while the probability for a female participant staying that long is 82%. This plot also shows that attrition patterns for men and women were similar until around training day 32, when male attrition leveled off and female attrition continued. Male recruits who attrited had a median number of training days completed of 15, compared to female attritees who completed a median of 26 training days. The log rank test showed that the survival patterns over time for men and women were significantly different ($p<.003$). Female recruits were 1.647 times more likely to attrit than male recruits (95% CI for the hazard or risk ratio = 1.239 to 2.189).

Trauma. The log-rank test revealed a statistically significant difference between the survival patterns over time ($p<0.005$) for recruits with and without a premilitary trauma history. Among attritees, recruits without a trauma history spent a median number of training days of 24

days versus a median of 22 days for attritees with a history of interpersonal trauma. Recruits with a history of interpersonal trauma were 1.48 times more likely to attrit during recruit training than those with no such history (95% CI for the hazard or risk ratio = 1.102 to 1.987).

Gender and Trauma. The Kaplan-Meier plots for males and females with and without interpersonal trauma showed lower retention rates for participants of both genders with a history of trauma (Figures 2 and 3). The log-rank test showed no statistically significant difference between the retention patterns for male participants with and without premilitary interpersonal trauma ($p>.310$), but did show a difference in retention patterns for female participants with and without a trauma history. Females with a history of interpersonal trauma were 1.58 times more likely to attrit during recruit training than those with no such history (95% CI for the hazard or risk ratio = 1.034 to 2.413, $p<.032$).

Additive Model. Next we examined an additive model evaluating the impact of trauma and gender on attrition using a Cox regression. This model indicated that participants with a premilitary history of interpersonal trauma were 1.4 times more likely to attrit during recruit training than those with no such history, and that female recruits were 1.4 times more likely to attrit than male recruits (Table 3). An interaction term for trauma and gender was also run with this model, but was not significant.

Discussion

The results of this study demonstrate that individuals entering the USMC with a premilitary history of interpersonal trauma are at greater risk for attrition during recruit training, and are 1.4 times more likely to drop out of recruit training than individuals without a premilitary trauma history. This risk was highest for female recruits. Female recruits with a history of interpersonal trauma were about 1.6 times more likely to attrit during recruit training than women without a history of trauma. A statistically significant difference between the retention rates for the male participants with and without premilitary interpersonal trauma was not found, despite a trend shown in the Kaplan-Meier plot in that direction. The lower rates of trauma and attrition in our male subjects resulted in a relatively small sample size of attrited male subjects, and this may explain the lack of significant results. Analysis of these issues in a larger sample may find significant results for male participants comparable to those shown here for females.

This study is the first to document the relationship of premilitary trauma to attrition in Marine recruits. In general, our finding that individuals with a prior trauma history are at greater risk of attrition supports findings of other studies examining the relationship between premilitary trauma and attrition. However, earlier studies found that male recruits with prior trauma histories attrited at a *higher* rate than female recruits with similar histories,^{11,12} while our results showed that men with a premilitary trauma history attrited from recruit training at a *lower* rate (12.7%) than women with a premilitary trauma history (20.2%). While this discrepancy may be due to the broader definition of trauma used in the current study as compared to earlier studies, the most likely reason for this difference is the very high base rate of attrition for women in the USMC. Other branches of the military have more similar rates of attrition for men and women. Because of the large difference in attrition rates for male and female Marines, it may be more important to understand the reasons for attrition within each gender rather than to focus on gender comparisons.

This study was unique in that it measured "days to attrition" using survival analysis. A different pattern of attrition was found for men and women, with male attrition leveling off around training day 32 and female attrition continuing until the end of recruit training (training day 63). It is difficult to draw inferences about training costs from this information. In general, the longer a recruit is in the military, the greater the financial investment the military has in that individual. This study only evaluates attrition in terms of the number of training days completed, and does not look at the total time that a recruit spent in the military. These numbers may differ widely. Recruits who injure themselves, for example, may spend up to several months in a medical rehabilitation platoon (MRP) before being subsequently discharged from recruit training. Their discharge data will indicate how many training days they completed (prior to the injury) and will not include any time spent in the MRP.

The participants in this study reported high rates of interpersonal trauma, with 47.7% of males and 68.1% of female participants reporting a history of at least one interpersonal trauma. Comparable figures for combined interpersonal traumas are not readily available, but rates of specific interpersonal traumas in the general population have been found to be substantially lower. The National Comorbidity Survey (NCS), which measured rates of trauma in more than 8000 respondents, found a lifetime prevalence of rape in women of 9.2%, compared to 23.9% in our sample.²⁵ The rate in this sample is particularly alarming given that the survey question referred only to adult rape (after age 18 or older). Since 68.5% of the women in our sample were 18 or 19 years old at the time of the survey, a very high number of these rapes occurred in the 1-2 year period immediately prior to enlistment.

Rates of some childhood traumas in our participants also were markedly higher than in the general population. The prevalence of childhood physical abuse in the NCS was 3.2% for men and 4.8% for women, compared to rates of 26.7% and 38.3% for men and women respectively in our

study.²⁵ Reported rates of childhood sexual abuse in the general population have ranged from 2.8-16.0% for men and 12.3-27.0% for women compared to rates of 14.7% for men and 51.0% for women in our study.^{22,25} Thus, the rate of child sexual abuse in our male participants is consistent with those in the general population, but the rate in our female participants is substantially higher. In addition, 26.5% of males and 31.2% of female participants reported some type of interpersonal trauma other than childhood physical or sexual abuse. Again, these figures are higher than reported in the NCS for non-combat-related interpersonal traumas during adulthood.

Although trauma rates for our participants are dramatically higher than those found in the general population, they are comparable to those found in other studies of military personnel. For example, large-scale studies of Army and Navy recruits have found rates of childhood physical abuse ranging from 27% to 36% for men, and from 25% to 40% for women.^{13,15,17,26} Similarly, these and other studies have found prevalence rates of childhood sexual abuse in military recruits ranging from 10% to 18% for men, and 26% to 53% for women.^{12,13,15,17,27-29} Some of the broad variance in these prevalence rates is likely due to differences in the definition of child sexual abuse between studies. In general, the studies with lower prevalence rates defined child sexual abuse as occurring before age 14, while our study extended the range to any sexual abuse that occurred prior to age 18. Studies of female military recruits have found a rape prevalence rate between 18% to 36%, consistent with our findings.^{13,17,27-29}

The participants in this study entered the USMC not only with high rates of childhood abuse, but with high reported exposure to other interpersonal traumas in adolescence and early adulthood. It is not clear why our sample and other enlisted military samples report higher rates of trauma before entering the military than is found in the general population. One possible explanation is that individuals from economically impoverished backgrounds may be attracted to the military for the employment and training opportunities it provides, opportunities that may not be readily

available in their community. Many children growing up in such environments are chronically exposed to traumatic stressors, and rates of victimization and other life stressors have been shown to be higher in children and adolescents of lower socioeconomic status.³⁰⁻³² Analyses of the average socioeconomic status of incoming recruits to each of the four branches of service found that military recruits had lower overall socioeconomic status than 18-24 year-olds from the general population.^{33,34} Military recruits also showed lower levels of paternal and maternal education levels on average when compared to the general population of 18-24 year-olds.³²⁻³⁴ If individuals from impoverished backgrounds are over-represented in the armed forces, it is not surprising to find higher levels of trauma in enlisted military personnel than in the general population.

Anecdotal evidence from clinicians working with military and veteran women points to the possibility that individuals from chaotic backgrounds, such as families where abuse is present, may be attracted to the stability and structure of military life. It may offer them a way to "escape" from an intolerable and possibly dangerous home and community situation. This may contribute to the higher rates of childhood abuse in our sample, particularly among the female recruits.

Individuals with a history of trauma may be more likely to attrit during recruit training because of the way they interpret and react to the stresses associated with boot camp. Recruit training is a time of significant emotional and physical stress for all recruits, as they adjust to the structure and discipline of the military while they are learning and being tested on a number of different skills. These subsequent stressors may trigger or exacerbate PTSD symptoms in some individuals with a trauma history. These symptoms, which might include recurrent, intrusive thoughts and images of prior traumas and stressful experiences, impaired concentration, disrupted sleep, and emotional distress³⁵, may impair the recruit's ability to perform required training tasks.

It is important to note that, while premilitary trauma may be associated with attrition, most individuals in the military with trauma histories do not drop out. The impact of an individual's

trauma history may be buffered by personal and interpersonal resource characteristics, which help him or her cope effectively with subsequent stressors. Analyses of more than 1600 Vietnam veterans exposed to war zone stressors found that hardiness and postwar social support mediated the effects of traumatic stressors and additional negative life events on post-war adaptation.³⁶

To the extent that trauma is extremely common in the present military personnel, the armed forces need to develop policies and procedures to directly address the specific adjustment and adaptation needs of these recruits. Ignoring these important background vulnerabilities will not help those men and women who truly have the ability to serve and simply need assistance in overcoming what should be considered a manageable pre-existing condition. Due to the difficulty of identifying recruits with a trauma history, these policies would need to be applied to all recruits, and could serve to bolster strengths even in individuals without background vulnerabilities. Potential interventions could include cognitive-behavioral programs for developing coping skills, decreasing anxiety and managing interpersonal conflicts, for example. Such programs could be easily implemented early in the recruit training process to help recruits better cope with the stress of recruit training.

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Table 1

Questions about events and experiences that qualified as interpersonal traumas**Childhood Trauma Questionnaire(CTQ) ²¹**

1. I got hit so hard by someone in my family that I had to see a doctor or go to the hospital. (Childhood physical abuse)
2. People in my family hit me so hard that it left me with bruises and marks. (Childhood physical abuse)
3. I believe that I was physically abused. (Childhood physical abuse)
4. I got hit or beaten so badly that it was noticed by someone like a teacher, neighbor, or doctor. (Childhood physical abuse)
5. Someone molested me. (Childhood sexual abuse)
6. I believe that I was sexually abused. (Childhood sexual abuse)

Sexual Abuse Screening Questions ²²

When you were aged 17 years or younger, can you remember having an experience that you would now consider sexual abuse and that involved:

1. Someone touching you, or grabbing you, or kissing you, or rubbing up against your body either in a public place or in private? (Childhood sexual abuse)
2. Someone taking nude photographs of you, or someone exhibiting parts of their body to you, or someone performing some sex act in your presence? (Childhood sexual abuse)
3. Oral sex or sodomy (anal sex)? (Childhood sexual abuse)
4. Someone trying or succeeding in having sexual intercourse with you? (Childhood sexual abuse)

Sexual Experiences Survey ²³

When you were 18 years or older:

1. Did anyone ever force you, threaten you, and/or take advantage of a time when you had used drugs or alcohol to have vaginal, anal and or oral intercourse with you but did not succeed? (Attempted rape)
2. Did anyone ever force you, threaten you, and/or take advantage of a time when you had used drugs or alcohol to have vaginal, anal and or oral intercourse with you with any amount of penetration? (Rape)

Modified DIS ²⁴

1. You were raped. (Rape)
2. You were sexually molested. (Childhood sexual abuse)
3. You were seriously physically attacked or assaulted. (Serious physical attack or assault)
4. You were physically abused as a child. (Childhood physical abuse)
5. You were threatened with a weapon, held captive or kidnapped.

Additional Traumatic Experiences

Have you experienced any other situation that was not already asked about which was extraordinarily stressful? If yes, please describe what happened.

Table 2

Rates of Different Types of Interpersonal Traumas Shown by Gender

Type of Trauma	Prevalence rate		Items used to determine presence of trauma
	Males (n=832)	Females (n=698)	
Childhood physical abuse*	26.7%	38.3%	CTQ #1,2,3,4 or DIS #4
Childhood sexual abuse*	14.7%	51.0%	CTQ #5,6, Finkelhor #1,2,3,4 or DIS 2
Attempted rape*	4.1%	15.4%	SES #1
Rape*	3.5%	23.9%	SES #2, or DIS #1
Serious physical attack or assault (other than rape)	12.8%	11.0%	DIS #3
Threatened with a weapon, held captive or kidnapped*	17.6%	8.0%	DIS #5
Any interpersonal trauma ^{a,*}	47.5%	68.1%	

^aBecause some individuals reported more than one type of interpersonal trauma, this number is not a sum of the other percentages.

*difference in rate between males and females significant at $p < .01$ level.

Table 3

Cox Regression Model Showing the Effect of Premilitary Interpersonal Trauma and Gender on Attrition

Variable	Coefficient (β)	Standard Error	P	Risk Value	Ratio	95% CI
Trauma	.3212	.1467		0.029	1.39	1.04 to 1.85
Gender	.3358	.1403		0.017	1.41	1.07 to 1.85

Figure 1

Kaplan-Meier Plot of Attrition by Gender

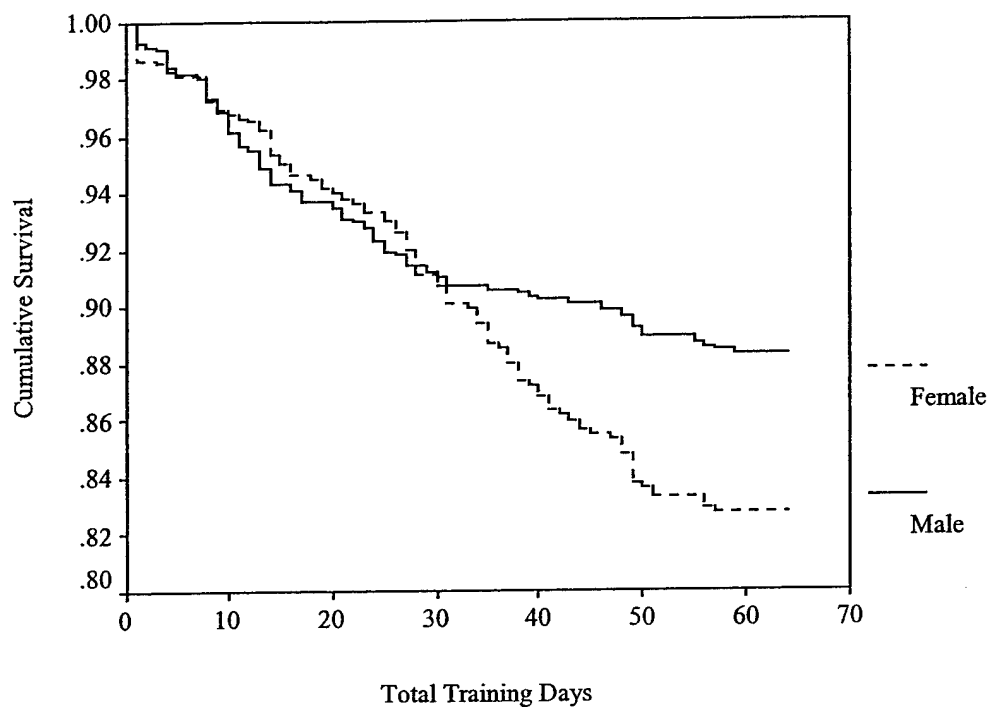


Figure 2

Attrition for Males With and Without Premilitary Trauma

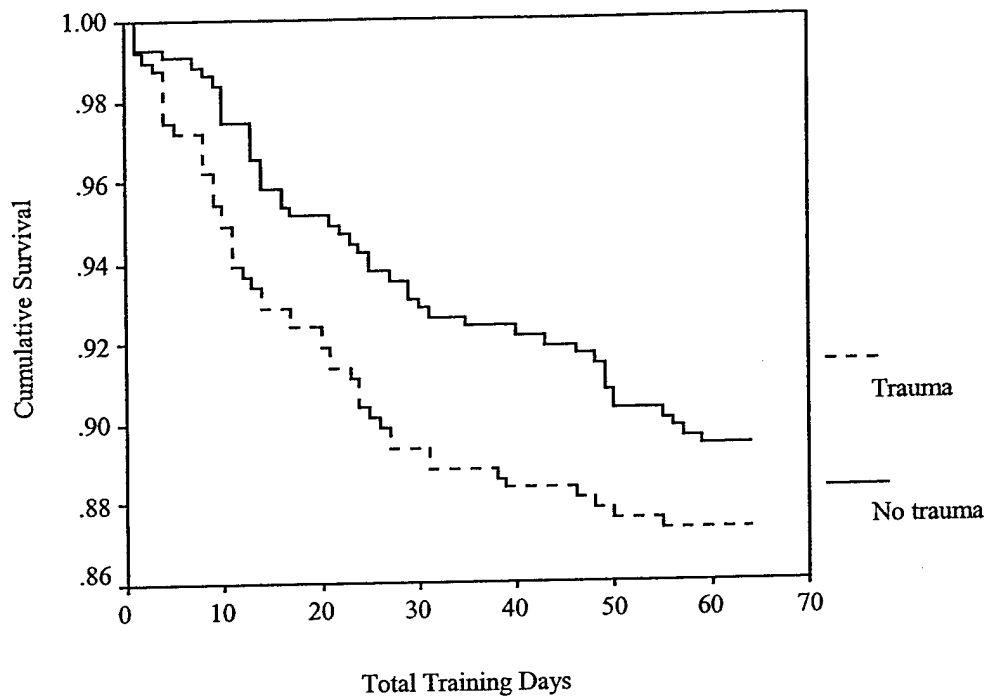
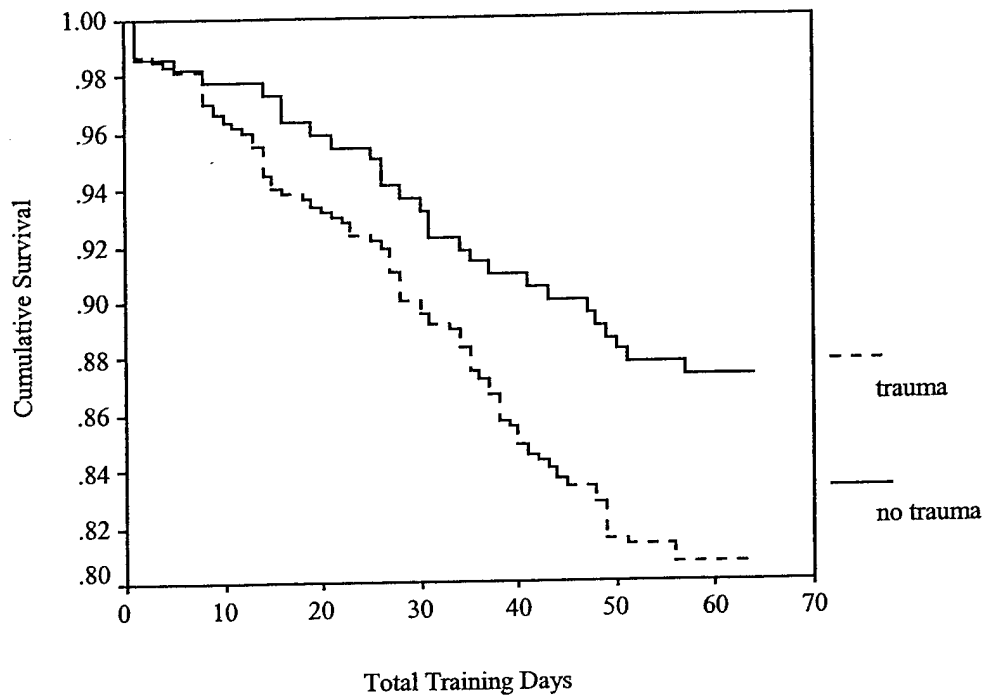


Figure 3

Attrition for Females With and Without Premilitary Trauma



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